THE UNIVERSITY
of EDINBURGH

THE GENESIS AND ANATOMY OF THE INDUSTRIAL BIOFUELS STRATEGY OF SOUTH AFRICA

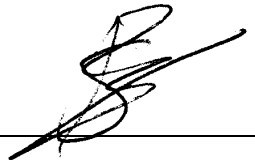
Shaun Ruysenaar
S0957457

A thesis submitted to the Centre for African Studies, School of Social and Political Sciences at the University of Edinburgh, in fulfilment of the requirement for the Degree of Doctor of Philosophy.

University of Edinburgh, 2014

DECLARATION

I, Shaun Ruysenaar, hereby declare this my own original work except where explicitly stated otherwise. It is submitted for the Degree of Doctor of Philosophy at the University of Edinburgh. It has not been submitted for another degree or examination at any other university.

Signed:  .

Date: 10 March 2014.

ABSTRACT

Instrumental accounts of policy start at the policy document—the framework for action—and move on from there, identifying gaps, criticising shortcomings or praising proposals. Critical and interpretive reviews of policymaking regard it as a *process* to be examined rather than an *outcome* to be managed. At the core of this thesis, the Biofuels Industrial Strategy of South Africa presents a new terrain in which to examine the policy process before such instrumental approaches become pertinent. In doing so, pervasive underlying 'win-win' and 'pro-poor' narratives and associated discourses articulated and legitimised by constituent vested interests, global and local networks (the biofuels assemblage) and the power relations between them are scrutinised as part of the 'messy politics' of policymaking. Through such an investigation, the thesis adds to the understanding of policymaking in South Africa and seeks to instil the importance of interpretive approaches to analysing policymaking. Ultimately, decisions around biofuels highlight the importance of meaning and cognitive frameworks that policymakers bring to the table and the symbolic nature of policy.

It must, for example be made clear what purpose policy actually fulfils rather than simply subscribing to social constructions of instrumental success or failure. There is a lingering if not hegemonic supposition that although South Africa has 'good' policy, implementation 'fails' due to capacity. While this may be the case, it is inadequate as an explanation of 'policy failure', where remedial action then becomes more about improving capacity, which may only serve to reify the abstract disjuncture between policy and practice. Rather an attempt should be made to 'problematise' what makes policy either 'good' or 'bad' but more so unpack the taken for granted in policymaking and how policy itself is part of wider sense making processes whilst also fulfilling symbolic roles beyond the merely instrumental.

Given an inescapable reality in which politics and knowledge share a dialectic relationship in policymaking, we should rethink the veracity and technocratic assumptions of evidence-based policymaking and the value of 'knowledge' in policymaking processes over and above the way policymakers frame and interpret issues themselves. Considering 'evidence' to be a *deus ex machina* or panacea, as it is in New Public Management proposals, may very well be short sighted. Neglecting the interpretive and political aspects of policymaking, especially within the technical realms of renewable energy in general and biofuels in particular is equally myopic.

Deconstructing the nature of the policymaking process around biofuels has wider implications or findings for the South African context. One can see, for example, the perseverance but slight reconfiguration of the Minerals-Energy Complex (MEC) and a large-scale technological fetish that continues to control the vision and direction of renewable energy transitions (and policies thereof) in the country. Corporate networks are, however, only part of the picture and decisions and decision makers involved in the process extend beyond an 'MEC elite', but increasingly include ANC political gatekeepers who inscribe their own ideologies and meanings into policy. These are especially acute in the form of narratives surrounding decisions made, such as the broad-brush exclusion of maize in the face of an emotive and racially politicised food-versus-fuel storyline.

If a free society cannot help the many who are poor, it cannot save the few who are rich.

John F. Kennedy (Inaugural speech, 1961).

Biofuels development could induce a paradigm shift in agriculture and rural development. Sustainable biofuels production can provide up to 1.1million jobs in Sub-Saharan Africa.

(Cockerill and Hongo, 2005).

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND INITIALISMS

ACF:	Advocacy-Coalition Framework
ANC:	African National Congress
ARDA:	Agrarian Research and Development Agency (formerly Sugar Beet RSA)
ASFC:	African Sustainable Fuels Centre
ASGISA:	Accelerated Shared Growth Initiative of South Africa (2006)
Asgisa-EC:	Implementation agency of Eastern Cape Department of Agriculture (no link to ASGISA)
ASPO:	Association for the Study of Peak Oil
BEE:	Black Economic Empowerment
BBBEE:	Broad-based Black Economic Empowerment
BFAP:	Bureau for Food and Agricultural Policy
BISSA:	Biofuels Industrial Strategy of South Africa
B-JIC:	Biodiesel Joint Implementation Committee
BRICS:	Brazil, Russia, India, China, South Africa (group)
BTT:	Biofuels Task Team
CEF:	Central Energy Fund
CEO:	Chief Executive Officer
COMPETE:	The Competence Platform on Energy Crop and Agro-forestry Systems for Arid and Semi-arid Ecosystems
COP17:	Conference of the Parties (17^{th} meeting held in Durban, South Africa)
COSATU:	Council of South African Trade Unions
CSIR:	Council for Scientific and Industrial Research
CURES:	Citizens United for Renewable Energy and Sustainability
DAFF:	Department of Agriculture, Fisheries and Forestry (formerly DoA)
DANIDA:	Denmark's Development Cooperation
DDG:	Deputy Director General
DEAT:	Department of Environmental Affairs and Tourism
DoA:	Department of Agriculture (now DAFF)
DoE:	Department of Energy
DME:	Department of Minerals and Energy (subsequently DoE)
DST:	Department of Science and Technology
DTI:	Department of Trade and Industry
DWAF:	Department of Water Affairs and Forestry (subsequently DWA)
ECDALA:	Eastern Cape Department of Agriculture and Land Affairs
ECDC:	Eastern Cape Development Corporation
EDC:	Energy Development Corporation (within the CEF)
EDD:	Economic Development Department
Eskom:	Electricity Supply Commission (the national energy supplier, rebranded from ESKOM)

FDI:	Foreign Direct Investment
GEAR:	Growth Employment and Redistribution (1996)
GIBN:	Globally Integrated Biofuels Network
IDC:	Industrial Development Corporation
Mossgas:	PetroSA's gas-to-liquid plant at Mossel Bay
MBA:	Master of Business Administration
MEC:	Member of the Executive Committee (e.g. 'provincial minister')
MEC:	Minerals-Energy Complex
MSc:	Master of Science
NERSA:	National Energy Regulator of South Africa
NGO:	Non-governmental Organisation
NPM:	New Public Management
PetroSA:	Petroleum Oil and Gas Corporation of South Africa (subsidiary of CEF)
PGBI:	Engineering and technical development consulting firm specialising in, *inter alia*, sugar and biofuels
PISCES:	Policy Innovation Systems for Clean Energy Security
PhD:	Doctor of Philosophy
RDP:	Reconstruction and Development Programme (1994)
RSA:	Republic of South Africa
Synfuel:	Synthetic Fuels (produced from coal- or gas-to-liquid technology)
SAPIA:	South African Petroleum Industry Association
SBRSA:	Sugar Beet RSA
SIP:	Strategic Investment Project
SMME:	Small, micro, and medium enterprises
ToR:	Terms of Reference

RACIAL CLASSIFICATIONS AND NOMENCLATURE

Two issues of importance need to be clarified before continuing. The first is racial classifications used in this thesis. Although the terms 'Black', 'Coloured', 'Indian' or 'White' may be considered or construed as racist (and outside of South Africa this is sometimes the case), the South African government uses them as formal categorisations and the terms are widely employed in political and popular discourse. I have thus elected to retain such classifications within this thesis, even though I am sceptical as to their ultimate value (as I am of most monolithic categorisations).[1] Furthermore, 'coloured' in South Africa is a racial categorisation in itself, referring to a heterogeneous ethnic group possessing ancestry from Europeans, and various Khoisan and Bantu tribes of Southern Africa, with a significant proportion of such people residing in the Western Cape province of South Africa. It is not used as a derogatory term as may be construed from its use in the United States of America and elsewhere.

Second, biofuels are a complex technology spanning a variety of disciplines (from agricultural economics to chemical engineering) and thus there may be sections of this thesis replete with associated jargon. Where possible, I have provided some description of terms as footnotes, have moved technical discussions to appendices or have attempted to write descriptions using non-technical terms. There are of course limitations as to what can and cannot be redefined. Some 'biofuels' parlance therefore remains.

[1] It could be argued that such categorisations are indeed a hangover from apartheid era planning but, for example, are used in the national census and remain an important means of measuring the improvement of previously disadvantaged communities.

PREFACE

At the COP17 negotiations in Durban, the South African Department of Energy arranged their own colloquium, bringing to the fore a range of issues around sustainable or renewable and conventional (fossil based) energy in the country. Amongst the range of topics was biofuels. One of the presentations, by the Employment Creation Fund, highlighted a 'new' focus on the 'green economy' and citing a project intending to develop 500,000 hectares of canola in the Eastern Cape to produce biodiesel. We will encounter this canola project as part of what I have termed a South African biofuels 'assemblage' (Cf. Smith 2010) or agro-industrial imaginary that is seemingly regaining some legitimacy after years of patiently pushing the 'biofuels' cause; largely in anticipation of a reassessment of the Biofuels Industrial Policy that was released in 2007 (DME 2007). This policy forms the basis of my thesis, which argues that policymaking is far more complex than existing reviews encourage us to believe.

At COP17, the debates were complex, raising among other issues the importance of policies, and more so getting policies right through—according to the Hon. Minister of Energy, Ms Dipuo-Peters—'sophisticated policy processes' that are inherently reliant on consultation and scientific foundations. Discussants were quick to identify the challenges of misaligned policy whilst at the same time appeared resolute on the need for evidence, rather than considering the more tricky details of how that evidence would be used and more so where it might come from. It is such taken-for-granted dynamics, amongst others, that form the content of my interrogation of the Strategy and characterise the 'messy' reality of policymaking.

At the very same negotiations, the Minister of Energy declared industrial biofuels 'on track', the policy a success and implementation towards targets likely to be realised as planned. As much as one learns to take such political proclamations with a modest (if not substantial) amount of scepticism, such optimism belies a far bleaker picture and far more convoluted trajectory. Immediately following the release of the strategy, vested interests within the industry and wider assemblage decried the vague and contradictory nature of the *final* Strategy, criticising its logic and lack of support for the industry. The situation has not changed significantly since 2007 so, to 'those in the know' and from 'whispers in the corridors', the Minister's claims could neither be further from the truth nor is it clear what is meant by the 'success'. In essence, this thesis attempts to identify both how and why the policy changed and its so-called 'success'.

After completing my MSc, which looked at institutions around food security in South Africa, I was appointed as a consultant within the Office of the Presidency to assist with the development of the War on Poverty Campaign. My 'job' was primarily

devising the institutional arrangements required for a full rollout of the programme. Through this experience, I encountered policymaking first hand but the experience was bittersweet. My 'hard science' grooming had once assured me that people were rational, policy-making was rational, and that with enough research, policies should be too, or at least get better as one goes along. I quickly learned that matters of fact, if one subscribes to such a doctrine, matter less than—or are perhaps equally dependent on—the political aspirations, vested interests and ideological drivers at work as well.

In the proposal phases of the PhD, I looked for a new policy that I could unpack, which, although different substantively, might resonate with what I had observed within the War on Poverty processes. A focus on institutions and government operations in my MSc had also driven me closer to interpretive policy studies as an area of interest; one undersubscribed to in South Africa considering the plethora of instrumentalist approaches and 'getting policies right'. (Obviously there are variations to such theme (policies differ in technical affinity) and there are exceptions to the rule, however, development as a particularly messy and 'wicked' policy problem appears deserving of far greater scrutiny.) A long interest in renewable energy and a matching of expertise with my primary supervisor, biofuels appeared apt. On paper, it seemed like there might be something to it. With a scoping of various documents produced by the Department of Minerals and Energy (DME) suggesting things were happening, meeting with policymakers to obtain their perspectives seemed possible, even if perhaps optimistic. Given the somewhat limited scholarship into dynamic policy-making processes in South Africa, there was certainly scope for a detailed, constructively critical analysis and review.

In one of my first interviews, the respondent set the scene for me with some alarm. "You're researching the biofuels strategy; how brave of you!" Not only did this respondent understand the complexity of biofuels as a 'development' technology but he also understood, from his experiences within the DME, the socio-political dynamics that, in some cases, conspired towards biofuels' quick demise and in other cases campaigned for their long and prosperous future. The situation, or at least government's approach was schizophrenic, involving manifold voices from both internal and external interests—multiple streams if you like—with stakeholder involvement being in a continuous state of flux. There was little consensus on the specific goals and objectives and even when there was it did not appear to last very long whereas interpretations differed as to what consensus meant. Although such complexity was largely unknown to me at the time, grappling with it further has it echoed some of my original thoughts on policymaking processes in South Africa, while also leading me into new areas of understanding.

Overall, this thesis traces my personal journey through the South African biofuels assemblage over the last three years. It details the original development of the

strategy, one both convoluted and contradictory. It describes how past current and the likely future projects match little with the original aspirations of the strategy (but not some of the agro-industrial imaginary underlying it), although this too is only half true, is open to interpretation and the success of which may be something entirely intractable. Finally an attempt is made to analyse what all this means and how it might reflect the minister's call for sophisticated policymaking. Any such call will need to acknowledge the important and not necessarily positive role politics, actor-networks, narratives and institutional configurations play within the policymaking process - factors that are neither easily circumvented nor necessarily manageable.

This thesis is, however, one interpretation and necessarily incomplete. Through interviews, open discussion, presentations, news paper reports, facilitations and a range of other activities that have peppered my engagement with the research, I have found there to be a plethora of 'smoke and mirrors', 'stories within stories' and 'blatant lies', intermixed with 'straight-forward', 'well-meaning' aspirations, proposals and approaches. Through some rigour I have tried to grasp as full a picture as I can, eroded in part by time and financial constraints and the willingness of key players to engage with me. In so doing, I have completed over 70 interviews with government officials and informants close to the policy processes. I have attended biofuels workshops in government, private sector and civil society environments, interacting closely with stakeholders on all fronts. Although a work in progress, as most policy research is, the preliminary review provides a wealth of detail and surprising twists and turns in South Africa's engagement with biofuels from a policy perspective. The lessons learned are important ones, with ramifications not only for biofuels policy in South Africa and biofuels policies elsewhere but also for policymaking in South Africa in general. The work should be of interest to policymakers and academics alike, not through providing specific substantive or remedial recommendations but to engage in reflexivity and debate about a crucially important and yet significantly under-researched aspect of governance in South Africa's teenage democracy.

As is customary, it must be stated that two peer-reviewed papers have emerged from the work in this thesis. The first was a theoretical paper I wrote in response to the rather rudimentary conceptual frameworks prevailing in the food-versus-fuel debate in South Africa (Ruysenaar 2011b). The second was a comparative piece with a colleague, Shishusri Pradhan. This paper was essentially a summary of some of the important outcomes of our theses with similar research approaches highlighting the role of narratives and networks in policymaking around biofuels in South Africa and India (Pradhan & Ruysenaar 2014). Some aspects of the research have also been presented at conferences in Sri Lanka (PISCES), Botswana (the Peoples Energy Network 2011), and Ireland (Universitas21). Two further papers are pending completion.

ACKNOWLEDGEMENTS

There are more people to be acknowledged than I could possibly fit in here so I first wish to make a very general but no less heart-felt expression of gratitude to all those involved in making this thesis possible, and to those in my life in general. Thank you all!

There are of course some people deserving of special mention that have been instrumental to the thesis and its completion.

Hans and Tessa Ruysenaar and Jonelle Smith have been incredible. Countless months away have not been easy on anyone and my folks have been unflinching in their support taking on the unenviable task of managing my various interests in South Africa. I know this has been a continuous headache and I am sincerely grateful. Jonelle, I hope that our holidays in Europe and the UK were of some consolation to our months apart.

To my supervisors James and Lawrence, sorry it took so long to get this finished but slowly your support and insights have guided me towards the proverbial light. I hope that it is not a train but indeed daylight at the end of the tunnel. Special mention should also go to the staff and my colleagues and officemates within the School of Social and Political Sciences (the very dear colleagues of Office 5.15 especially). I have thoroughly enjoyed my time in Edinburgh and have made what I hope become lifelong friendships with some fantastic people. Julie Grant was especially kind enough to critique some of the individual chapters, Elisabetta Spano to assist in the various submissions and Sylvia Seldon to provide shelter on my shorter stints in Edinburgh.

Whilst acknowledging those within the 'institution', I would also like to show my appreciation to the examiners of this thesis. Not only was the viva an exceptionally positive and productive exercise (and at the same time absolutely nerve-wracking), the examiners helpful suggestions and affirmations have given me much greater confidence in my work and towards pursuing further publishing. I hope I live up to their expectations.

To 'Uncle Pete', a warm place to stay in the cold winter months (and the onset of 'spring'?) was most generous of you and a rewarding time for me during the final drafting. You are always welcome in South Africa when you are in need of some real sunshine.

To Prof. Tebogo 'Job' Mokgoro, your insights on the 'day-to-day' of government and informative discussions of transforming the public sector have opened my eyes more

than I could have wished for; indeed, it is a fascinating and critical topic. I hope that our collaboration remains a long and fruitful one. As you say, South Africa needs all the help it can get.

A few interviewees have also taken considerable amounts of their time to afford me some insights, which I am sure they thought to be inconsequential but to me were incredibly useful. From government, Dr Rod Crompton of the National Energy Regulator; Dr Andre Kudlinski from the Department of Trade and Industry; Somila Xhosa from the Department of Science and Technology, Thuthukile Mosia from CEF (and more recently the Technology Innovation Agency) and Khanyiso Zihlangu from the Department of Energy, you have all met with me on more than one occasion and have provided thoroughly interesting discussions. I also wish to thank the many officials I have met only once, I know your time is precious. From outside government, Simon Wilson from the African Sustainable Fuels Centre, Andrew Makanete probably the most vocal of the earlier biofuels advocates, Annie Sugrue from Citizens United for Renewable Energy and Sustainability, Graham von Maltitz of the Council for Science and Industrial Research, Asogan Moodaly from Mabele fuels and formerly IDC, thank you all for your anecdotes and 'war stories'. Many other people contributed to the research through interviews; although I cannot list them individually, I do thank them greatly.

The Cannon Collins Trust generously supported the application and funding for my research, through which I was awarded a Commonwealth Scholarship from the British Government. Both institutions have continued to provide immense support throughout my tenure in the UK and I thank all the staff for their superb work.

A final acknowledgement has to go to the Policy Innovation Systems for Clean Energy Security (PISCES) consortium and their support in some of the activities I have undertaken in South Africa and elsewhere. Engaging with associated experts in the field (better stated as *many different fields*) has broadened my horizon significantly.

CHAPTER 1: INTRODUCTION AND THESIS OUTLINE

We live in a time of rapid technical and economic change characterised by increasing reliance on technical expertise to solve increasingly complex problems of global extent (see for example Leach *et al*. 2005). As Fischer (1990, p.14) suggests of this new amorphous post-industrial society,[1] there are primary defining features that include:

> the central importance of science and technology for economic growth, a high degree of organisational interdependence, increasingly centralised forms of economic and political decision making, greater reliance on technical experts and rapid rates of economic and technological change.

Experts also warn us that the world is in crisis, or, according to John Beddington (2009), faces a perfect storm of food shortages, scarce water and insufficient energy resources. As a central challenge, the latter energy crisis is increasingly characterised by 'peak oil', in which maximum global oil production has tentatively been reached—though debate remains—and will now enter the downward phase of the production cycle.[2] As these crises converge, biofuels, as the archetypal technology of the emerging bio-economy (Smolker 2008), are proposed as renewable and sustainable alternatives to fossil fuels, whilst providing a range of other benefits by responding to these global and interconnected challenges. Nevertheless, their uptake involves trade-offs to be made between social, economic and environmental costs and the grand claims of biofuels have seemingly over sold their actual potential (see below). At the same time, the expectation that biofuels have 'something for everyone' and that future breakthroughs are equally enticing has been a powerful motif in the

[1] It is perhaps wrong to specify this term as part of this discussion as there are a plethora of apt terminologies that identify with significant changes in society since the industrial revolution—these include, amongst others, the post-industrial, information economy and the administrative state (see for discussion Beniger 1986).

[2] Numerous experts at least suggest that global output will be reached by 2020 (Schmidt *et al.* 2012, p.7). On debates around peak oil in the South African context see Hender *et al.* (2007)). Peak oil is not the only energy crisis; energy security is increasingly defined at a range of levels and involves multiple energy sources. Whereas wealthier commuters face shortages and fuel-price hikes, local villagers and the urban poor without access to grid electricity and living in 'energy poverty' face rising coal and fuel-wood costs for cooking and heating (International Energy Agency 2008; Sanchez & Scott 2009). Increasing criticism is also directed at the dominant grid technologies such as coal and nuclear power given their contribution to climate change and other social and environmental externalities with increasing calls for a third-industrial revolution focusing on renewable energy systems (e.g. Rifkin 2011).

development of policies that seek to promote and govern this new technology (Birch & Ponte 2014).

South Africa, being one of the first countries in Africa to publish a formal strategy around industrial biofuels, has not been exempt from the global hype around biofuels emerging in the early 2000s. The Biofuels Industrial Strategy of South Africa (hereafter the Strategy/BISSA) evoked widespread criticism, from both industry and the wider public. However, there has been only limited interrogation of the development of the Strategy or at least an examination of policy processes through which decisions were made.[3] Given the complexity of this new technology, and the often highly emotive nature of arguments for and against their use (see below), the South African biofuels policy offers a useful opportunity to examine decision-making with regard to Fisher's (1990) defining features of the age, as described above, in the developing world context. In the next section, I will therefore provide some context of the global hype, whilst also locating the South African case study. Thereafter I will elaborate on the aims and rationale of the study.

It is also worth noting that biofuels are one (somewhat estranged) element of a wider South African renewable energy complex (see Appendix E), which is emerging because of specific political economies of energy transitions in South Africa. Baker *et al.* (2014) provide a recent an important contribution to this area, looking broadly at the renewable energy sector and energy transitions in South Africa (see also Tsikata & Sebitosi 2010). This is an important facet to the overall debate (and can be extended to the international level), in which competing visions for the future of energy and the route through which energy transitions will occur and are occurring are subject to powerful incumbents and other nuances within the sector. Especially important is the close linkages between the state and core businesses. In South Africa, the latter reflects a continuing but shifting Minerals-Energy Complex (MEC), which I discuss later (see also Appendix E for a brief theoretical overview). The direction of energy transitions also have deep historical roots that have created niches for some industries and locked out others, while there is also the importance of local

[3] As there was a draft and final version of this strategy, when discussing the draft I name it the *draft* Strategy. When referring to the final versions I will use either: Strategy, *final* Strategy or BISSA, depending on the discussion.

political economies shaping and being shaped by exogenous factors (Baker *et al*. 2014). I take such issues further, honing into the political economy of the biofuels assemblage, in which similar issues arise and emphasise the nuance of policymaking, in which much of the struggles over the future play out. While there has been some focus on renewable energy policies, grappling for example with the pitfalls of half-hearted policy (Sebitosi & Pillay 2008), looking at technical and economic barriers to the poorly performing sector (Tsikata & Sebitosi 2010; Pegels 2010) and proposing ways forward (Winkler 2005), biofuels are particularly interesting and may offer some greater insight.

SETTING THE SCENE: BIOFUELS (POLICIES) AND THE SOUTH AFRICAN BIOFUELS STRATEGY

Biofuels, or the more apt term 'agrofuels' (Cf. McMichael 2010a), are liquid fuels produced from agricultural biomass. As policymakers tend to homogenise technically complex phenomena into easily digestible formats—an activity I am most interested in within this thesis—I have provided a technical overview of biofuels in Appendix A, rather than digress from the discussion at this point. The more important subject here is that to both industrialised and developing countries alike, biofuels initially provided a lucrative opportunity, most notably for (agricultural) development. It is suggested, for example, that Biofuels:

> could induce a paradigm shift in agriculture and rural development. Sustainable biofuels production can provide up to 1.1million jobs in Sub-Saharan Africa (Cockerill and Hongo 2005).

Although part of a wider bio-economy and renewable energy complex, biofuels have an especially interesting trajectory. The promotion of biofuels as a 'silver bullet' for many of the world's most profound ills, was a proposition forged within the abstract realms of a global discourse, capturing the imagination of pundits, policymakers and a range of other actors in diverse contexts. In 2003, for example, a European Union Biofuels Directive (Official Journal of the European Union 2003) announced a new opportunity of global scope, not only presenting trade opportunities through a new policy-driven market but also establishing mobilising metaphors that permeated global media, stoking local interests and peppering national policies, research

missions and political utterances.[4] Eager market players and developers merged with political protagonists and a legion of optimists who saw manifold opportunities in the new phenomenon. From the North, ever-present objectives of ensuring national energy security[5] and meeting greenhouse gas emission reductions targets[6] have been clear drivers. Biofuels provided yet another panacea being a clean energy-security solution, reducing emissions and creating a new developmental path for the rural and agricultural sectors, especially in developing countries (Cf. Charles *et al*. 2007; Cushion *et al*. 2010). Africa was quick to react, with a cohort of countries forming the Pan-African Non-Petroleum Producers Association[7] or "Green Opec" (Biopact Team 2006).

From precarious origins (Cadenas & Cabezudo 1998) biofuels have found support within the new aspirations of a global bio-economy (Smolker 2008), a strategic element of low-carbon energy transitions (Robèrt *et al*. 2007) and have themselves become part of what may be considered a globally integrated socio-technological assemblage (Mol 2007; Smith 2010) or global biofuels imaginary (Birch & Ponte 2014). Encouraged by policy measures, global production of biofuels was estimated to be over 35 billion litres in 2006 (Commission of the European Communities 2006) increasing to over 100 billion litres in 2010 (International Energy Agency 2013).[8] While it is possible to talk of a global extent, and as the notion of a global biofuels assemblage suggests, it is also necessary to recognise that "there are distinct regional

[4] The ongoing Renewable Energy Directives (RED) in the EU continues this trend.

[5] One of the significant drivers of biofuels production is declining global oil reserves with increasingly rapid consumption. It is predicted that by 2025 the global demand for petroleum will have increased between 40-50 per cent (Johnston & Holloway 2007). At the same time, the rate at which conventional oil production can be increased has been reduced by the lack of refining capacity, and the fact that nearly 50% of the world's proven and probable conventional light crude oil reserves have already been consumed (USGS, 2004). Collective fears of diminishing fuel supply and energy security have thus pushed up oil prices not only making biofuels more financially competitive but are a reminder that at some point petroleum will need to be replaced.

[6] For example, the EU has proposed mandatory biofuel blends with petroleum of five per cent by 2015, and 10 per cent by 2020 (although these are currently under scrutiny and will be further reviewed in 2014). Being unable to meet its biofuel target due to insufficient agricultural land available in Europe, their demand has created an international biofuels market.

[7] Member states include Benin, Burkina Faso, Congo (Democratic Republic), Gambia, Ghana, Guinea, Guinea-Bissau, Madagascar, Mali, Morocco, Senegal, Sierra Leone, Togo, and Zambia.

[8] World biofuels production grew by 13.8% in 2010;biofuels accounted for 0.5% of global primary energy consumption. Growth was driven by North America (+17.7%) and South and Central America (+14.2%). It should also be mentioned that this is not the first time there has been hype around biofuels and spiking production, as similar occurrences have happened in the 1970s in the US. What appears different is that the US would be able to produce its own feedstock, Europe cannot.

patterns and alliances that cohere around various aspects of this polymorphous industry" (Hollander 2010, p.699).

The biofuels phenomenon allows for reviews through varying analytical frameworks. James Smith's (2010) conceptualisation of a global biofuels assemblage highlights the global extent of the 'biofueled' future. This global assemblage encompasses the tangible configurations through which global forms of techno-science, economic rationalism, and expert systems gain significance and shape interests, producing 'global' knowledge about global forms and striving to replace socially, politically, and spatially context-bound forms of knowledge (*ibid*, p.10). Smith (2010) argues the outcome is actually the globalisation of risk. Others look more at the configuration of the global biofuels commodity or value chains (Ponte 2013), how such a network is constituted and governed, and, for example, the implications for sustainability (Mol 2007).

An emerging focus on low-carbon energy transitions also has implications for our understanding of the development of a global biofuels regime. Theories of transition allow analysis of deep structural changes, providing both a description of the process of transition but also providing tools to explain it. From the 'energy transitions' literature—which draws from existing understanding of socio-technical transitions—there is a distinct understanding that multi-level perspectives are important (see Baker *et al.* 2014). Here, global and national (macro-)levels are characterised by 'regimes'—which forms the 'deep structure' stabilizing the existing socio-technical system (Geels 2004; Geels 2011).[9] Regimes are characterised by path-dependency and structural lock in (a "techno-institutional complex"), which resist change and hinders the emergence of alternative technological trajectories (Unruh 2000, p.817). An outline of the South African energy regime is provided in Appendix E and later discussions though Baker *et al.*(2014, p.4) describe it succinctly as incorporating "the

[9] Regimes, as with the widening perspective of 'governance', increasingly include non-state actors and institutions that are equally important in performing and directing the governance apparatus and defining the trajectory of (agrofuel) capitalism. For an example of this in the fledgling biofuels assemblage see Bailis and Baka (2011). Philip McMichael (1997; 2009) has written extensively on global food regimes, and more recently the global agro-food-fuels-feed complex (McMichael 2010a; 2010b) which have similar characteristics in their makeup.

state-run, coal-generated, publicly funded electricity sector [ESKOM at the core] and related institutions, policies and structures at the national level".

Niches are more micro-level spaces in which small networks innovate—Geels (2011, p.27) refers to this as "radical innovation"—and begin to agitate the overriding regimes in which they reside. Schot and Geels (2008) suggest the viability of such niches depends on three internal niche-level processes, which consist of the shaping and alignment of expectations; the formation of a social actor-network and, finally, learning processes. In my thesis we will see the existence of such a niche comprising the 'project level', though were actually supportive of, rather antagonistic to, a wider biofuels regime; being instrumental in the development of the biofuels regime in the first place and constitutive of a biofuels assemblage that extended beyond any niche boundaries. (The multi-level perspective is of course problematic when considering historical trajectories and attempting to neatly separate things. For example, the biofuels assemblage could itself be considered a niche and partner to other innovations within the wider renewable energy sector or as antagonistic to the existing fossil-fuels regime, but the biofuels assemblage comprises or is solidified around certain niche, landscape and regime components).

The latter raises the importance of the external environment, which influences both the macro-level and the micro-level; it acknowledges the importance of history and context. Geels (2011, p.28) considers the landscape to include "demographical trends, political ideologies, societal values and macro-economic patterns" and influences dynamics at the regime and niche levels. My addition to this literature considers the policy dimension to such transitions, further contributing to empirical evidence of how political economy factors and other niche, regime and landscape factors act to transform policy (and that the policymaking process is one lens through which these countervailing forces become most apparent). Primarily, my interest resides in the discursive practices through which, for example, niche actors define and propagate certain ideas within policy, and the way ideas are transformed and translated within policymaking.

Hype, Mobilising Metaphors and the Meta-narrative of Biofuels to the Rescue

Although only a caricature of biofuels' rise to fame—to give the de-contextualised technological phenomena human-like agency—the articulation of global 'win-win' narratives within the international biofuels discourse has had significant repercussions. According to Borras *et al.* (2010), it is these 'win-win' narratives that has been the basis of the emerging global 'biofuels complex'. They suggest further that:

> [t]his 'win-win' narrative is reflected in diverse policy debates in Europe (Franco *et al.* 2010) and in the United States (Hollander 2010 and Gillon 2010), and has dominated the framing of the biofuels debate globally (Borras *et al*. 2010, p.573).

In general, descriptions of the ways in which biofuels policies have been developed on the backing of such powerful and appealing storylines, appear to reflect a common pattern or meta-narrative. Such a meta-narrative matches a generalised blueprint proposed by Godin (2009), of how storylines are used to give meaning to science, technology and innovation and their elevation onto the political and policy agenda. The suggestion that something new and quite different from the past is happening in the economy initiates the storyline. The new phenomenon or change, once named, will generate positive returns, with such outcomes "either in the form of hype, hyperbole or utopia" (Godin 2009, p.17). Furthermore, narratives then need to be verified by statistics to qualify the new phenomenon and validate that a change is happening. Thereafter it is essential that policies be developed. Fundamental, and crucial to the overall critique of the agency of such narratives, is that all this is based on the premise that science technology and innovation "are good for you or society" (*ibid.*,p. 14). Godin finally proposes that a narrative "generally ends with policy recommendations, a series of policy objectives are defined, obstacles and conditions are identified, and targets suggested" (2009, p.19). This should not be taken to mean that there may be no truth in narratives, but rather emphasises their action over and above their content or truth-value in policy processes.

While promoting developmental issues amongst others, the elevation of biofuels onto the (global) political agenda—as a 'new' green technology—substantially compares to Godin's (2009) overall characterisation. Biofuels presented a wealth of benefits, even if unsubstantiated and premised on the political aspirations of the North. Fact-finding missions (such as that for the EU mandatory blending) ordained increased biofuels production, which, when following best practices and providing adequate support measures, would allow biofuels markets to deliver this range of benefits. Key to all of this is getting the policy right and, as I will discuss in later chapters, there was no absence of recommendations as to how to do so.

Confronting Complexities: Policy Perspectives and the Example of South Africa

As a technology, biofuels embody a problematic duality in which a range of technical benefits are couched with developmental aspirations of rural development and job creation, even where such promises often appear intractable in their implementation and contradictory in their assumptions, especially in the complex industrial sector and rural landscapes of South Africa. That is, however, the essence of narratives, especially global narratives; they posit powerful arguments while excluding local contingencies, abstracting from the very real situations that most often depart from such unsubstantiated storylines. With a rising tide of anti-biofuels sentiment emerging from project-level reviews that contrast the earlier predictions (Cf. Matondi *et al*. 2010), the appropriateness of biofuels is highly contested. There has also been the onset of a range of unintended consequences that have further challenged on-going support (see below).

When it comes to advancing any form of bioenergy, the ultimate outcome will depend on those implementing bioenergy activities and on the goals envisioned. At its simplest,

> the challenge is to create a policy and market environment that supports the design and implementation of bioenergy activities that contribute to sustainable development (Kartha *et al*. 2005, p.4).

As the political-economy approach to commodities suggests, it is not so much what the crop is used for (biofuels or otherwise) but how this is actually achieved that counts (White & Dasgupta 2010). There are therefore opportunities for 'good' and

'bad' approaches to biofuels, and these approaches are generally articulated, or steered through policies. It is therefore necessary to improve our understandings of how biofuels policies have been developed and reviewed. Summing up the situation, Von Braun (2007) argues that even though many of the plans to expand biofuels in developed and developing countries have been made with very little analytical basis, they have now become policy. Such a pronouncement does not, however, give much insight as to why such a situation prevails or what an analytical basis might comprise (Cf. Ariza-Montobbio *et al*. 2010; Gillon 2010; Pradhan & Ruysenaar 2014). This opens up to scrutiny the complex relationship between the discourse and narratives of biofuels and the processes involved in developing policies around the 'new' and 'exciting' technology.

The Biofuels Industrial Strategy of South Africa

A relatively superficial or 'normalised' description of the South Africa biofuels policy conforms to Godin's (2009) pattern closely. Initially, building on some impressive historical cases such as Brazil, with hype escalated by international enthusiasm and policies being formalised within the industrialised countries such as the EU and USA, the Department of Minerals and Energy (DME)[10] in South Africa decided to pursue biofuels by drafting an industrial-based biofuels strategy. A final version was submitted and accepted to Cabinet in 2007. The formal policy process—the articulation rather than implementation of the policy—was ostensibly set in motion two years earlier when the Cabinet approved the development of an industrial strategy targeted at 'creating jobs' and linking the so-called 'first and second economies' (Mtwa 2007). Aspirations of linking South Africa's dual economy, that is the so-called 'first' (agro-industrial commercial agriculture) and 'second' (poor peasant farmer) economies in rural South Africa as well as creating jobs therein, reflected a strategic drive towards using biofuels as a means of rural development. The additional and expected range of 'win-win' narratives were not absent.

[10]This Department subsequently split into the Department of Energy (DoE) and the Department of Mineral Resources during the 2009/2010 financial year.

The responsibility of developing a clear and rational strategy was entrusted to an interdepartmental Biofuels Task Team (BTT), which was to oversee all aspects of the policy development—evidence-based policymaking would be the basis for any way forward. After completing a Feasibility Study (Biofuels Task Team 2006), the Task Team produced a *draft* Strategy later in 2006 (DME 2006), which Cabinet then insisted required public consultation. A year later in December 2007, after public outcry, Cabinet released the final Biofuels Industrial Strategy for South Africa (DME 2007). In a dramatic shift in approach, the *final* Strategy accepted by the Cabinet excluded maize, due to food security concerns, and rejected *jatropha* (*Jatropha Curcas*) due to environmental considerations. The *final* Strategy removed any mandatory blending and reduced the cap on total blending from 4.5% to 2% of the national blend; it therefore looked significantly different from its predecessor.

South Africa, therefore, departs somewhat from the meta-narrative above, or at least experiences in other African countries, insofar as there was a broad reversal of the strategy, notably in its decision to exclude maize and declining necessary support to industry. Clearly, there is nuance at the local level, though it should be noted that a similar reversal of support (at least for first-generation biofuels) has occurred in the international sphere. The early and extensive 'hype' around biofuels faded not only due to contingencies at local levels but also as policymakers and proponents confronted the inherent complexity and onset of multiple unintended consequences. The global food crisis of 2008, for example, was blamed to various degrees on increased maize-to-ethanol production, landing the food-versus-fuel debate on the global political agenda; the issues reverberating through local debates. The basis of this debate is whether the production of biofuels competes with food production, thereby limiting both the availability of food supplies and decreasing its accessibility through increased prices (Eide 2008; Mitchell 2008; Cf. Ruysenaar 2011; Chapter 7; Appendix C). Poor energy ratios and greenhouse gas savings, amongst other issues, have also resulted in increasing media opposition and far wider academic scrutiny.[11] Biofuels went from being a prized new development franchise, as the quote above

[11] In addition to debates around food-versus-fuel there are also the emerging threats of large-scale land acquisitions or 'land-grabbing' (e.g. Cotula 2012), ecological and climate related threats from indirect land use change (Searchinger *et al.* 2009; Tilman *et al.* 2009), poor energy outputs and the limited potential for biofuels to substitute fossil energy (OECD-FAO 2007).

suggests to a "crime against humanity".[12] While it is common for contrary views to develop when considering development interventions, the broad reversal in opinions of biofuels is novel (Smith 2009a).

In South Africa too, research into the potential benefits and drawbacks of biofuels links them intrinsically to a complex mix of debates surrounding climate change, fuel, feed and food security, as well as becoming fashionably aligned to 'development'.[13] The issue is that all these topics are susceptible to different interpretations, normally comprising diametrically opposite views that need to be taken into consideration when making decisions. Yet with some momentum behind them, biofuels remain firmly on the global and local agenda, so decisions as to their future will continue to be important. Some scholars insist a more balanced view be taken given such persistent and widespread support (Birch & Ponte 2014; Daschle 2007; Cf. Mathews 2007; 2008). Even a more balanced view, however, appears to be one of deep cleavages and polemics. If anything, biofuels are better known for their complexity and resultant confusion than any specific benefits, whether practical or perceived. Such contrast is not inconceivable, given the rush toward a 'biofueled future' being based on, in part, policymakers faith in the wide-ranging, almost mystical, professed gains, which have risen to the status of blueprint narratives for 'development' and more specifically 'rural development' (Birch & Ponte 2014; e.g. Ariza-Montobbio *et al*. 2010; Pradhan & Ruysenaar 2014).

RATIONALE AND AIMS OF THE THESIS

The above discussion highlights that a 'northern', policy-based, 'win-win' biofuels agenda of global extent has prefaced significant policy shifts in the global South (although Brazil is an obvious outlier or rather a 'Southern' leader within the assemblage), though both the priority and judgements of their actual value are no

[12] In 2007, Jean Ziegler the United Nations' independent expert on the right to food called for a five-year moratorium on biofuel production to halt what he called a growing "catastrophe'' for the poor and that it was a "crime against humanity'' to devote agricultural land to biofuel production.

[13] Development itself is a wholly problematic term (see for example Sachs 2010) as will become clear in later sections and will be considered more thoroughly in the main thesis. One would have to consider especially 'whose' development and who benefits when considering biofuel-based interventions.

longer ubiquitous and only positive; counter narratives have emerged. The rational of this thesis emerges from the situation in which policymakers are confronted by a range of issues that need to be considered when making decisions whether or not to support biofuels and how to manage their uptake. To understand how decisions are made, it is imperative to examine how policymakers are engaging with both the reality (configured around historical and present political economies and transitions) and the hype; the type of information used to weigh up such decisions and who actually decides. Despite widespread criticisms of biofuels policies—South Africa included—there is limited research into how those policies have actually been made.

To date there has been some scholarly evaluation and theories of how the South African biofuels policy was developed (described later in the thesis), though these do not detail the nuances of the shifting narratives and wavering support of the stakeholders and how these relate to the decisions made. Few lessons are therefore learned as to what such decisions suggest about the wider context of renewable (and non-renewable) energy and rural development in South Africa, how these realms define the scope of policies, a closer appreciation for what policymaking actually means and incorporates meaning and how it acts, especially symbolically. Such an instance is reflected by the general remarks that the strategy was crafted exceptionally poorly, at least depending to whom one talks, with the insistence being that politics trumped economics (Adams *et al*. 2009). The details of how and why politics trumped economics and how this is important to policymaking are left unexamined if not entirely sidelined. Part of the answer is that the expectations placed on biofuels made them both very easy to support (or not support) but very difficult to operationalise. One could perhaps suggest the former revolves around different processes than the latter and thus requires critical reflection. In relation to how policies in South Africa might mean or act (see concluding chapter), the policy process therefore provides a useful lens with which to interrogate wider issues of rural development (agro-industrial complexes) and energy transitions in the face of existing political economies and the overbearing Minerals-Energy Complex (MEC).

To build on this broad rationale, the next few paragraphs will reiterate some emerging concerns in particular relation to South Africa and the corresponding aims of the research.

The above discussion has begun to suggest that international discourses and their provocative narratives—that is knowledge and received wisdom—both initiate and may circumscribe policies in local contexts. A first main overarching aim is to interrogate this process further and illustrate how such processes unfold. Such a focus has to consider not only what international discourses and narratives mean for policymaking in local contexts but acknowledge that such interactions equally take shape in response to the characteristics of local contexts and are driven by local players and imaginaries. While Godin's (2009) schema essentialises the importance of narratives for policymaking (see also Chapter 2), they do not act alone. They are part of wider discourses or modes of thinking and encounter local structural and ideological differences in local contexts. In this case, South Africa is particularly interesting and unique. Its historical reputation as a technological leader, with a highly competent industrial and scientific sector and an abundance of resources at its disposal, has been eclipsed by a woeful development trajectory based on segregation and elitist control through institutionalised racism (see Chapter 3). The understanding that an Energy-Minerals Complex (MEC) emerging during the partheid era exerts significant influence over the political economy and continuing macro-economic trajectory is especially significant though is also in a state of flux. So too is South Africa's current prominence within the global South, as an emerging economy and partner (or competitor—or colloquially considered as a *briquette*) within the BRICS countries, makes it even more imperative that the gaps between the rich and poor are closed given the perception that the means exist with which to do so. The ANC-led government, meanwhile, has proudly self-proclaimed a development-state status for South Africa, though such a classification appears amorphous and outside of current capacities (see Edigheji 2010a; Chapter 3; Chapter 8). In this context, the conflicts concealed within the win-win narratives become increasingly acute and problematic, especially when the high-tech nature of biofuels themselves (and the socio-technical imaginary developing around them) have to be reined in to meet the needs of politicians, policymakers, technicians, as well as other major stakeholders. Often, the

public and especially the poor are completely forgotten or marginalised within this mix of interested and affected parties.

An important part of the context and the value of researching the policy process in South Africa is that policymaking has been problematic in its own right. (It is not just decisions around new technologies to be used for development that make policymaking of interest, though they do add additional dimensions.) Through nearly two decades of democracy, the South African government has faced significant challenges in converting development policies and strategic goals—in which defining the problem can be more difficult or contentious than designing the solution—into reality, especially for the benefit of many millions of poor and vulnerable within the country. That is, despite being known for *good policy*, South Africa is beleaguered by *poor implementation*. This situation suggests that there are questions as to whether the South African Biofuels Industrial Strategy will meet the expectations provisioned. If one were to be instrumental or deductive about analysing such a policy, untangling the disjuncture or relationship between the policy objectives (what the policy says), the outputs (what people do in response) and the outcomes (what tangible results emerged) would be sufficient as an analysis. However, such an approach takes for granted the unwritten aims of the strategy, leaves unexamined the role of the state in contrast to other powerful entities and interests and 'black boxes' the processes through which such policy objectives are entwined and become implicit within the strategy. It also leaves the social construction of policy success or failure unexamined. A focus on only what is explicit leaves a whole area of enquiry neglected and hides the important nuances when deciding to decide. It therefore does not allow us to unpack and contextualise the meta-narrative proposed above. A second overarching aim is thus to consider not whether the policy will meet its prescribed objectives but the symbolic value of such policy, how prevailing objectives were legitimised and decided on as part of a process imbued with unequal power relations and complex historical and emerging socio-technical transitions, drawing on very specific evidence or 'knowledges'.

From a general South African perspective, such a concern is not mine alone.

> In South Africa, there is a tendency on the part of many analysts and scholars to ignore implementation and operationalisation, but a more serious weakness is a frequent engagement in deductive approaches through which they remind us what is wrong with … policy before telling us what the actual policy is. They are often unfamiliar with the goals and intentions of policy as they refuse to consult primary texts, often because they are removed from the behind-the-scenes reality, and too lazy to familiarise themselves with primary information and to engage with decision-makers (Landsberg 2012, p.2).

Büscher (2009, p.3951) also suggests there is an unhelpful division between a technical, quantitative bias and "simplistic ideas about policy processes and dynamics" and more thorough qualitative and interpretive approaches. Such a reliance on quantifiable data may not be as useful as other methods such as process-tracing (George & Bennet 2005), which may tell us much more about how government decisions are made. Evaluating policy thus remains locked into more instrumental 'implementation-based' assessments, generally demanding technical fixes when the policy objectives have not been met (see Box 1; Chapter 3). The idea here being that a policy handed down to the bureaucracy has encountered an 'implementation deficit' (Hogwood & Gunn 1984; Pressman & Wildavsky 1984). Thus, if policies are failing to achieve their outcomes, it is usually considered a technical issue relating to poor implementation to be dealt with through better management. Under the pretence of failing 'implementation', little focus is given to the policymaking process itself (Omamo 2004). Recent anthropological research into development projects illustrates how this maybe too simplistic (see Box 2 of Chapter 2). What appears to be 'good policy' is quite possibly also 'unimplementable' policy as David Mosse (2004; 2005) has shown. A corollary here might suggest that 'bad' policy is equally prone to tenuous value judgements and not indicative of the ability to implement it, as the two issues—policy and implementation—may comprise different activities or are too closely aligned to be separated out so neatly. In separating the two, the mechanisms to create good policy may be very different to those that make it implementable (*ibid*). When combing them, policymaking can be likened to incremental 'muddling through', in which Lindblom (1959) suggests that implementation is a part of rather than apart from policy. Managers and street level bureaucrats then make their own decisions and interpret and implement policy in their own way (Lipsky 2010).

This thesis uses the drafting of the biofuels strategy as a case study in which some of these policy processes (described further in Chapter 2) may be examined in more detail to provide a deeper understanding of policymaking as a socially-dynamic political process in South Africa, over and above a purely technical process. It also means moving beyond industry perceptions of the biofuels policy as a failure and assessing what precisely is 'wrong' with the government's decided trajectory. By interrogating value-judgements of whether policy is 'good' or 'bad', the aim of this thesis, is to provide a nuanced investigation as to what makes such 'judgements' possible, given the existing challenges in and conceptualisations of policymaking in South Africa (see Chapter 3). In doing so, and based on the theoretical proposals discussed in the next chapter, it is the drivers and complexities of policymaking that I aim to illustrate better. That is, narratives are not propagated by themselves; they are fashioned through complex networks and forged through existing practices and perceptions of what those practices are or should be (Chapter 4); they are subjected to received wisdoms and institutionally bounded rationalities (Chapter 5); legitimised by fact finding and evidence gathering (Chapter 6) and, finally, dramatically shift in the face of uncertainty and perceived risks (Chapter 7). Narratives and the resulting policies may have entirely different objectives than those made explicit in documents and formal communications; they also reconfigure and permeate the actions and outcomes of various actors, institutions and politics.

In considering how the government and its wider constituents 'make policy', and who decides what the expectations are, the importance of power within such processes also needs far greater examination. Power here refers not only to overt power (pluralist interest-based behavioural power 'over') and covert power (shaping the agenda) but of Lukes's (1974) third, invisible power, which moves beyond any coercive conception of power or conflict to latent conflict and shaping interests; an agent of power over and one that is interest shaping and perhaps of subconscious domination.[14] There is also then a need to identify with the mechanisms of power. For Marxists, this relates to class structure (Hill 2005). Foucault considers power to be everywhere, existing in diffuse forms, embodied and enacted rather than

[14] One might better consider these dimensions as forms of power (Gaventa 2006) rather than 'dimensions', the latter being measurable instances of the same thing rather than differing in characteristic as Lukes so-called dimensions appear to represent.

possessed, discursive rather than purely coercive (Gaventa 2003). Power is inseparable from and expressed through/by knowledge, or rather power-knowledge (Foucault 1980). By this, power transcends politics and is rather an everyday, socialised and embodied phenomenon, in which discourse is essential to its operation. Such a situation compels us to problematise policymaking and consider what knowledge has framed such policy processes, not to provide solutions but understand how such problems are constructed, and how certain realities are sold as solutions; it 'makes the familiar strange' as Colebatch (2009b) would proposition. As an example, we have to ask what satisfies as evidence, how it is produced and by whom. When asking how narratives and discourses are confronted by and compel decisions, the question needs to be asked whether biofuels, as a mechanism for rural development, is the influence of discourse and discursive power or one of sound empirically justified practice. The answer to that is also directly linked to how allegiances and actor-networks influence such decisions, and why the influence of politics and power insists that no technology is neutral or benign within policymaking processes.

Overall, the above discussion suggests that policymaking is important—but not only in a technical/instrumental sense—and, more so, it requires examination as a dynamic activity. For this reason, my main aim in this thesis matches a more 'interpretive' approach when investigating what could be best termed the knowledge-policy interface (see Chapter 2). My objective is to provide a more nuanced, situational perspective, focussing on the processes involved in the development of the South African strategy, rather than taking the South African strategy as a given or trying to bind the operations of officials to a specific normative model. Unpacking misconceptions and the details of what the Strategy actually says are not neglected, as some commentators have conflated 'having a policy' with 'making progress'. This is not to suggest that instrumental studies are unimportant, and that policies cannot be broadly demarcated as such. It is, however, important to determine whether technical analyses are the dominant factor in the biofuels policy process, or whether decisions have been primarily driven by politics. As part of this situational perspective, I propose to dissect the dynamics of policymaking, suggesting that there is no neat boundary between implementation (or at least objectives and outcomes)

and policymaking, while insisting that the two are inherently connected (e.g. Mosse 2005) and may co-evolve as socio-technical imaginaries (Jasanoff & Kim 2009). Building on Mosse's (2004) paper, Büscher (2009, p.3953) highlights of the South African case:

> energy policies seem to increasingly reflect development policies more broadly about which recent anthropological 'ethnography of aid' concludes that "they generate mobilizing metaphors ('participation', 'partnership', governance', 'social capital') whose vagueness, ambiguity and lack of conceptual precision is required to conceal ideological differences, to allow compromise and the enrolment of different interests, to build coalitions, to distribute agency and to multiply criteria of success within project systems" (Mosse 2004, p.663). What this means in practice, often, is that increasingly contradictory realities are often represented or supposed to be 'solved' by policies that do not acknowledge contradictions but rather 'organise' or frame social realities such that they can be better managed.

The Crux of the Matter

When taken together, the above rationale and aims attempt to answer a question I was confronted with repeatedly in research interviews. One version was "why on earth would you want to study such a disaster of a strategy?" Such a question highlights both the perceived failure of the strategy (my study being a post-mortem thereof) but also the focus of most stakeholders on the instrumental desire to get policy right. Such ambitions, as important as they are, fall within an overall bias towards *policy analysis* rather than seeing value in *policy research* or policy process analysis (see Box 1). Rarely do such analyses tell us why things go wrong when they do, and how that failure is constructed, let alone deconstructed. Similarly, most people take the failure of the strategy as a given—there is not much point in looking backwards or even sideways—and move onto more interesting issues. This too is important as, although perhaps too dismissive of the past, policies are generally forward looking. Such a sentiment was clearly suggested by a current member of the Biofuels Task Team when discussing any chance of revising the strategy: "*We won't bother rewriting the strategy; we are focusing on regulations now* (BTT member E 2013)." Once a certain direction has been articulated and the governance apparatus gains momentum, it becomes very difficult to turn back.

Box 1: Policy Studies

There is some interchange of the terms policy analysis, policy research, and policy studies so some clarification on their use in this thesis is appropriate. I conform to Fisher's (2003) categories in which **policy studies** is a general field of enquiry. A subset of this is, **policy analysis**, has an "applied orientation and seeks to identify the most efficient alternative for dealing with a current problem" (Young 1997, 1). Such analyses reflect the linear assumptions or instrumentality of policy whereby *ex ant* (*a priori*, *pre hoc*, prospective) analyses are undertaken before the selection and implementation of a policy (Puentes-Markides, 2007). The purpose of such an analysis is both 'predictive' (to anticipate likely effects that might result from the adoption of a particular policy) and 'prescriptive' (providing recommendations to achieve a particular result). Thereby, *ex ant* analyses inform the processes of decision-making and deliberation. In stages subsequent to policy formulation and implementation, *ex post* (*a posteriori*, *post hoc*, and retrospective) policy evaluation is undertaken. Ultimately, *ex post* evaluation determines whether policy implementation satisfies established policy outputs, objectives and outcomes (Hogwood and Gunn, 1984; Puentes-Markides, 2007). In less technical jargon, policy analysis provides information for making-decisions and identifies so-called 'implementation gaps' to be managed and corrected afterwards. Both *ex-post* and *ex-ant* analyses are transfixed on research 'for' the policy process; considering it an instrumental process that can be improved by more data and the instrumental use of positivistic research. As Hill (2004) suggests, there is the separate research agenda questioning the nature 'of' the policy process: **policy research** in Fischer's (2003) nomenclature, or, otherwise as '**policy-process analysis**'. It is the latter to which this thesis subscribes, as will be discussed in-depth in Chapter 2.

The same respondent followed on by highlighting the need for greater capacity being the reason why the government has taken so long to sort the regulations out. As mentioned above, part of interpreting and unpacking the policy process one has to reconfigure the questions of 'capacity'. Existing assumptions subscribe to the policy-implementation binary that dominates South African policymaking discourse. My thesis argues that we need to move past such a binary, by which ideas of capacity become far more revealing and embedded within a far more complex situation. While there has been much focus on the implementation of policy in South Africa, little has been devoted to how and what knowledge finds its way into decisions and whether it is possible to provide a deeper understanding of policymaking as a social process, over and above been a purely technical process within the South African context (although characteristically the two usually run somewhat parallel).

Given the broad aims detailed above, the thesis aims to add to various bodies of knowledge by making the following broad contributions that will be detailed through the thesis and the conclusions. Reflecting on the title of the thesis, I primarily detail empirically the genesis and anatomy of the biofuels policy in South Africa, adding to

existing reviews. As the first phase of what is set to be a long and convoluted process, the drafting of the initial and final strategy needs documenting in its own right, to allow for a detailed record. As part of this historical detail, important findings emerge that shed light on wider debates and which are illustrative of wider dynamics within South Africa. These conform to the major socio-technical realms of the agro-economy and renewable-energy transitions within the country.

Though the thesis discounts the purely instrumental understanding of policy, and at the same time, it illustrates that even as instrumental policymaking the biofuels strategy is deeply flawed. The evidence upon which it was based was myopic and unclear, at worst suggesting far different decisions should have been made. If we are to be entirely instrumental, a comprehensive diagnosis should be at the core of any strategic planning. That the evidence use in such a diagnosis has been clearly flawed is one overarching indictment on the policy itself. However, it is not enough to question the evidence or provide more of it; it is imperative that a critique is levelled toward the rationalisation of so-called 'evidence-based policy itself, unpacking the networks of support and discursive structures behind the evidence. While the biofuels policy illustrates policymaking may be a challenge to the realisation of South Africa as a developmental state, it equally highlights shortcomings in the appeal to evidence-based policy as a solution. Not only does one have to reiterate the importance of the politics of evidence (see Chapter 6), in which evidence is subject to and created within existing power relations and discursive frameworks and therefore may not provide the truth-value expected, but ignoring that policymaking is political (or assuming that politics is avoidable) is highly problematic and short-sighted. Simply 'subscribing' to evidence-based policymaking is not a credible solution, or at least, entails its own shortcomings and dangers. Whereas critiques emerging from the Sociology of Scientific Knowledge or 'Science Studies' literature suggest that the promise of scientific solutions to policy problems may be somewhat dubious, it appears that in South Africa the quality of the evidence itself is highly problematic, not only in terms of rigour, but in terms of the political meanings it is subjected to. Evidence-based policy discourse may therefore overvalue the importance of 'getting the policy right', based on misconceived notions of evidence,

when the real importance lies in getting the politics right in the seeming face of a rising anti-intellectualism within the political hierarchy.

Ultimately, the main conclusions and findings allow us to decipher how do policies mean in South Africa: the socio-political and institutional scaffold insists policies have to be vague but, increasingly such policies reflect an anti-intellectualism and over subscription to abstract accounts of, for example the duality of the rural economy. In so doing, policies become anti-developmental based upon mismatched and hegemonic global win-win narratives and local misconceptions (despite rhetoric suggesting otherwise) and increasingly reflect anti-democratic overtones and a return to technological fetish and limited participation in policymaking processes beyond core-networks and elitist representation. Issues such as these are encountered throughout the thesis, and will be returned to in the concluding chapter.

THESIS SUMMARY

The introduction raises numerous areas of research and contextual clarifications that the remainder of the thesis addresses. Some of the discussion in the following chapters may appear diffuse or disconnected, however, I have weaved these strands together to present a holistic picture and make clear the ways they fit together. For this reason, the thesis may in places shuffle between themes and issues, as maintaining a strict logical flow is difficult given the nature of the topic. Certain discussions thus may rely on information provided later in the thesis or in the appendices. Where this is the case, I have provided references to relevant sections. The same can be said for how I deal with the local and international levels. Biofuels, as an interconnected global assemblage (Smith 2010; Mol 2007) present a challenge in that the local and international are interconnected and transcend any neat distinctions – that is, regimes and niche's interact and are connected in complex ways through networks and flows. For this reason, in the remaining chapters, I will discuss South Africa with some inclusion of the international where relevant.

The theoretical and methodological framework, discussed in the next chapter is probably best described as eclectic. An important case can be made—as this thesis

begins to—that 'problematising' policy processes reflects a greater appreciation for taken-for-granted power and politics within policymaking. As I will discuss in the in-depth methodology chapter, there are three broad categories of how policymaking (and especially the use of knowledge within them) has been conceptualised. The first two fall roughly within an instrumentalist framework in which policy is largely rational, designed to match specific purposes and knowledge is inherently 'good' (in terms of utility). The third more critical approach suggests that policies are constructs of power, developed through discourses and narratives, actor-networks and institutional configurations that all have a bearing on the resultant policy. Existing power relations are therefore embedded and expressed within policy (Jones 2009). Broadly, one could thus consider that I take a critical approach rather than a 'problem solving' one, the latter of which:

> takes for granted the framework of existing power relations and institutions and is concerned with the smooth functioning of the system. By contrast, critical theory calls the very framework into question and seeks to analyze how it is maintained and changed (Ford 2003, p.121 drawing on Cox 1981).

Considering that a wide variety of technologies and solutions are at the heart of international and national debates around biofuels, discourse and narrative analysis fits well with some of the focus and complexities of the study, helping to identify how policy ideas (the problems, technologies and solutions) are articulated and communicated. Furthermore, a network analysis helps sort out actors and their interests, the way they organise and mobilise and how various groups of stakeholders form alliances or disperse at certain stages of the policy process as well as create and disseminate knowledge.

Overall, the theory chapter therefore provides a conceptual framework through which the policy process analysis is guided, discussing both the empirical data gathering and analytic frames. As an interpretive policy-process analysis, the two key data sources have been in-depth discussions with policy-makers involved in developing the policy, as well as textual analysis of the policy documents themselves. An interpretive approach, however, should acknowledge the contribution of what Stone (2002) refers to as the 'rationality project'; theories from this well-populated literature provide important explanatory devices as well.

To 'ground' the empirical study, Chapter 3 (as well as further descriptions given in Appendix C&E) provides a literature review of current understandings of policymaking in South Africa but also the institutional structure of the governance apparatus. In a sense, this literature review is also a meta-analysis, which forms part of the wider problematisation of the biofuels policy and policymaking processes in South Africa in general.

In Chapter 4, I begin more of an empirical discussion by describing the biofuels projects in South Africa and looking at their inclusion in policymaking processes, both at the provincial and national levels. Although the details of this chapter are important to the national biofuels strategy, I will outline the development of a provincial strategy. Here, despite a global hype dictating some initial terms of reference and creating (legitimising) a space for biofuels, their translation into policy has not been straightforward, although the provincial and national developments do follow similar patterns as each other. The importance here is that, from the outset, biofuels have been driven by specific mandates and issues that reflect hegemonic developmental discourses and narratives that abstract from local realities and thus easily weld together a diverse set of interests at national and local levels. To justify such a position, I will discuss the types of projects that have begun to emerge, compared to the limitations and overriding context within which a biofuels programme would have to operate, as well as the key drivers involved (specifically key actors and agencies). This first empirical chapter therefore also presents an introduction to some of the major players—that a discussion of the project level introduces some of the major policy players already says something!—and sets the stage for the empirical review at national level. Chapter 4 also brings into focus the government's flagship project: the Cradock bioethanol plant. In keeping with the direction of the thesis, I have focussed mainly on the links the project has with national policymakers but have also included an associated appendix detailing its origins (Appendix D). This project highlights not only individual nuances at a project level but the murky borders between and conflicting agendas within policy-making and implementation.

In Chapters 5, 6 and 7, I present the empirical findings from the national-level reviews. Chapter 5 looks at the emergence of the biofuels strategy, the prevailing interests in the strategy and the importance of policy frames when 'deciding to decide'. This chapter also provides insight into the emerging discourses and narratives and way in which they are used to garner support. Chapter 6 considers the idea of evidence-based policy in the case of biofuels (and somewhat in general), in which I critique the Feasibility Study through a Science and Technology Studies (STS) rubric. The final empirical chapter is an empirical narrative describing and problematising the nuances of the strategy's development up to the release of the final draft. Two existing studies of the policy are also brought into the discussion to compare and contrast my own findings.

The final chapter—Chapter 8—provides a concluding discussion.

CHAPTER 2: POLICY MATTERS … BIOFUELS POLICY REVIEWS, THEORIES OF POLICYMAKING AND THE RESEARCH METHODOLOGY

'Policy' is a nebulous term describing something that mediates all of our lives. It is ubiquitous, encountered in the organisation(s) of schools, businesses, government and most realms subject to collective action. Public policy, however, carries with it some particular nuance. Public policymaking is distinctive because it is assumed that public-sector (collective) approaches to many social problems are desirable, necessary and ultimately unavoidable (Pollitt & Bouckaert 2004). That such policies are 'public' makes them inherently important to the citizenry but also suggests we question the implied instrumentality of government policy with as much interest as we show the problems they are expected to resolve (though the two are, of course, not mutually exclusive).

Anderson (1997, p.2) defines policy as "a relatively stable, purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern". Policy is a phenomenon that encompasses a wide range of definitions but may essentially be considered 'declarations or plans' as well as 'actions on the ground' (Court & Young 2003, p.4). These definitions are, however, rudimentary and policymaking is far more complex. Policy, for example, may be purposive but purposes can be defined retrospectively (Hogwood & Gunn 1984) and problem solving can be incremental and a process of 'muddling through' (Lindblom 1959). As Michael Hill (2005) highlights, policies imply a web of decisions that change over time, with complicated linkages to existing policies, operating within what are usually crowded policy spaces. One also has to recognise that policy processes are important for what is excluded as much as for what is included[1], how actions may be taken without decisions being made, how actions differ compared to what is said (e.g. Lipsky 1980) and the way policies may be used to construct success and legitimise existing practices (e.g. Mosse 2004; Colebatch 2009). Policy therefore

[1] Dye (1998, p.1) provides a clear indication of this when considering that public policy "is whatever governments choose to do or not to do", although one has to recognize that the shortcoming here is that choosing not to do something means it has made it onto the political agenda. As Bachrach and Baratz (1962) suggest, covert power within policymaking processes means that many issues do not make it this far (see also Lukes 1974).

needs to be seen as what happens rather than what policymakers say will happen. Its analysis can vary from interrogating the structural features through which it is made, to investigating the processes and the various participants' actions or agency. One could further differentiate, as Michael Hill (2005) does, that one can undertake research both *for* and—as is the focus here—*of* the policy process. Harold Lasswell (1951), the so-called 'father' of policy science, maintained that there should be a science of and for the policymaking process (see also Torgerson 1985; Box 1 in the previous chapter). Keeley and Scoones (1999) frame the two as shifting from 'policy analysis' to 'policy-process analysis'.

In the previous chapter, I outlined that the biofuels Strategy in South Africa presents a fertile terrain in which to examine policymaking in South Africa, which I intend to do so in the form of policy-process analysis. At the core of the analysis, is the explicit importance of how certain forms of knowledge and its surrounding actor-networks inform policy and policymaking. The point being to unpack the underlying assumptions, discourses and narratives in which, and through which, the Strategy has been developed and framed. In addition, it seeks to impart some emphasis on wider networks within the policy-process, configured in this case around a new technology, and not necessarily limited to only political ones. This agenda will attempt to understand the drivers of the strategy, as a complex social dynamic, rather than expressing the strategy as some kind of given. The focus then becomes not only the stabilisation of a particular interpretation or 'policy model'—or the power that lies in the narratives that maintain the definition of the problem (Roe 1991)—but also the way in policy interpretations are produced and sustained socially (see Latour 1996; Mosse 2005; Mosse 2004).

To contextualise such an approach, in this chapter I begin by discussing aspects of the existing reviews of biofuels policies internationally. First, I identify some of the common themes within biofuels' strategies and policies internationally. Second, I examine how this literature, focussed on policy *review*, falls short of in-depth investigations into how the strategies were developed. Third, I provide an overview of those studies that begin to take on a policy-process analysis that is similar to my own. Finally, I situate my work within a wider theoretical discussion of how the

policy-process and its analysis may be understood, extending on the introductory discussion in more theoretical terms. Thereafter, I will discuss the empirical methodology.

A BRIEF EXCURSION INTO EXISTING BIOFUELS POLICY RESEARCH

There are two main axes within the existing literature around biofuels policies in Africa (although the same is true for international reviews). The first, itself comprising two main themes, focuses on the policy documents themselves rather than how they are produced. Within this first 'axis' then, the authors first tend to outline the policy responses taken by African governments, highlighting the purpose and intent of the policies—what the policies say or what they plan to do—and second, provide recommendations of what they should say and/or do. The second major axis within the literature comprises scholarly investigations into the processes through which policies are made. These studies are thus policy-process analyses that ask why the policies are made the way they are.

The First Axis: Silhouettes and Situational Analyses

A proliferation of biofuels policies over the last ten years has been matched by equally numerous situational reviews of the policy characteristics specific to, for example, different African countries (Mangoyana 2009; Jumbe *et al*. 2009; Practical Action 2010; COMPETE 2009; Diaz-Chavez *et al*. 2010), international comparisons (e.g. Sorda *et al.* 2010; Talamini *et al.* 2013) and collective characteristics or differences into specific focuses such as the types of feedstock or scales of production (Jull *et al*. 2007). In some cases, the focus has been to what extent policies set up an enabling environment (Jumbe *et al*. 2009). Others have grappled with the tensions inherent in the designs and objectives of necessarily complex policies (COMPETE 2009; Davison *et al*. 2010).[2] Common themes explored in the above situational reviews involve types of feedstock approved, licensing criteria and laws regulating the industry, production quotas and a host of other important

[2] Merging the financial imperatives and fuel security interests of powerful multinationals and governments in the North with the needs of rural development in the South, the two of which may ultimately be irreconcilable, is something neither easily, nor necessarily equitably achieved.

considerations needed to govern a biofuels industry, or roll out bioenergy based programmes, of which biofuels form a part.[3]

In addition to more content-based assessments of 'what polices say', some researchers have provided analyses of the feasibility of biofuels production within certain countries. Notably, many governments (for example Kenya, Swaziland, South Africa and even the SADC secretariat from a regional perspective) have undertaken feasibility reports to assess their potential to produce biofuels (feedstock). While being extremely important, these reviews do not delve into the policymaking process itself (see below). Additionally, while most authors highlight in some way the importance of policy, they do not estimate how feasible the resulting policy proposals are from an implementation perspective. Being a nascent phenomenon, there are limited longitudinal studies documenting the degree of success of policies and resultant projects, other than that of major biofuels producers (though see case studies of Haywood *et al*. 2009; Martin *et al*. 2009; Schut *et al*. 2010). Confusing the matter further is that, in many cases, biofuel production is occurring within a regulatory or institutional void making it difficult to demonstrate any policy successes (Von Braun 2008). Producers are largely left to their own devices and sustainability criteria or related principles are not mandatory. It is also here where Charles *et al*. (2007) foresee the need for a 'bio-pact' between the North and South. The North, in their opinion, might better sanction exploitative producers and enforce standards more rigorously. Nevertheless, there are also important considerations made as to whom the benefits of biofuels should go and what countries have done to achieve their objectives.

While detailing what policies say, the situational reviews are silhouettes that mask a far more complex reality. The shadowed snapshot keeps hidden important details, trivialising both the political and social interactions involved in policymaking. This is not to reduce the obvious importance of these reviews but rather to emphasise that the transfer through which, and contexts in which individual policies are derived require greater attention. In response, there is a multitude of prescriptions suggesting

[3] The difference between bioenergy and biofuels is an issue I discuss in Appendix A.

how to develop such policies, providing recommendations of *what policies should say* and *what they should attempt to achieve*.

The First Axis Continued: Recommendations for Effective Biofuels Policies (and Policymaking?)

Jull *et al*. (2007) provide an early but informative review of biofuels policies internationally (though mainly developing countries). Their focus was to promote a discussion about the needs of biofuels policies but not necessarily provide a prescriptive framework. They do, however, provide a comprehensive summary of the existing generic structures of biofuels policies as well as a schematic framework of important issues to be considered (such as those noted above). They outline two major types of strategy employed by policymakers thus far to regulate the biofuel industry, these are:

- creating regulatory frameworks for bioenergy or biofuels by passing legislation specifically on the subject and,
- committing to produce biofuels by formulating policies that are not legally binding but designed to complement existing national legislative frameworks.

In undertaking or considering these types of strategy, Jull *et al.* (2007), also highlight the multi-sectoral/dimensional nature of biofuels in which policymakers need to include, for example, a variety of environmental protection, economic and social development measures. In the case of the first especially, there is a strong reliance on existing legislation and institutional arrangements, such environmental impact assessment regulations. If these are already weak, or worse, inoperable, adding a biofuels agenda to the mix is likely to exacerbate the situation. Jull *et al*. (2007), conclude that a firm legal basis is fundamental to properly regulate and support the development of bioenergy. Furthermore, they argue that countries that have sound policies to promote the production and use of bioenergy will be at the forefront of realizing the economic and environmental benefits of this sector. Governments therefore need to promote institutional capacity building within their ministries at the national level, to ensure coordination within government as well when following consultative approaches, which ensure that industry groups and NGOs are represented within policy formulation.

With many situational analyses of the types of policies and general circumstances, there is a definitive tension exposed within the African context with pressure on African governments to *get the policy right*. In response, experts and institutions have provided a number of recommendations to ensure that solid regulatory frameworks are established (e.g. COMPETE 2009; Cooper & McAlinden 2012; Mabee 2007). Calls are strong for evidence-based policies, taking into consideration, for example, rigorous feasibility (Mangoyana 2009). A technical approach to policymaking is clearly privileged, relying largely on evidence-based policymaking. Many of these recommendations come from existing thematic research such as around land tenure (Cotula *et al*. 2008) and best practices from Brazil (Hira & de Oliveira 2009) and also involve ensuring appropriate mechanisms such as mandatory blending and incentives (Cf. Lawrence 2010; Cf. Miranda *et al.* 2011; e.g. Ziolkowska *et al.* 2011).

A standard emphasis in any new development franchise is sustainability and biofuels have been no different. There are range of frameworks establishing the relevant policy criteria (e.g. Roundtable on Sustainable Biofuels 2010) and specific mechanisms such as certification (Scarlat & Dallemand 2011), as well as some case studies exploring how these criteria are beginning to or may ultimately be achieved (Amezaga *et al*. 2010; Chalmers & Archer 2011). Franco *et al*. (2010) take this a step further, contrasting optimistic assumptions of the sustainability and benefits of biofuels according to EU policy with what happens in reality in other countries.

The reviews within this first thread of literature pre-empt more complex policy-processes in highlighting that, even at a technical level, there are no clear cut or 'win-win' situations when it comes to incentives, tax rebates or subsidies and other stipulated policy measures but that they involve a range of negotiations and trade-offs. Similarly, despite recognising tensions and providing concomitant recommendations of how to get policies 'right', incorporating a range of agendas that accompany multiple stakeholders, while doing so quickly enough to ensure a competitive advantage, suggests that such recommendations may be poorly implemented if not entirely ignored. Any biofuels policy invariably involves a wide

range of stakeholders, with very different vested interests, though many of the recommendations around biofuels policy consider the challenge of accommodating such a diverse group with different influential power unproblematic. In the same way real world complexities may be trivialised within policy (Mangoyana 2009), so too are those of policymaking as social and political process when recommending engagement. Such a situation therefore necessitates that the process itself is examined. In the next section, I provide some examples of studies that have begun to do so, as these are especially important in informing the research I present in later chapters. These studies also preface the theoretical underpinning of my study, which I describe immediately after them.

The Second Axis: Interrogating the Making of Biofuels Policies Internationally

The second major thread of biofuels policy reviews entertains research *of* policymaking itself, though the approaches and findings differ between studies. Some authors have begun to unpack the lessons of the biofuels experience from a more rigid political-science perspective, attempting to model the process. Charles *et al*. (2007), for example, contextualise the activities of policymakers dealing with biofuels within a political-science rubric. They thereby classify the current processes engaged by policymakers as predisposed towards incremental changes (an original theory of policymaking developed by Lindblom) in policy, mostly existing agricultural policy, when what is necessary are higher order mixed-scanning models (a model originally proposed by Etzioni).[4] In another example, Delshad (2012) provides an empirical model of the influence between the media, Congress and the President to identify "who influences whom" in the agenda-setting phases of the US biofuels policy. He highlights (2012, p.194) that "these actors have comparatively little agenda-setting power over one another; instead, their agendas are all influenced by factors outside of their direct control." Such factors include the maize price (or rather lobbying from agro-industrial networks), as well as biofuels being

[4] According to Etzioni (1967), there are three ways of making decisions in social policy, namely: the rationalistic one, which involves having sufficient information to make rational decisions, the incremental (or science of muddling through), which uses imperfect information to do the best one can, mixed scanning, which is a hybrid of the two. The latter involves scanning the situation, rather than getting all the possible information and then making either the fundamental decisions (similar to rationalist but not based on perfect knowledge) or incremental ones (which are taken in amongst the more fundamental decisions).

overshadowed by issues of wider public interest. Both these examples focus on modelling the decisions taken and are therefore less descriptive of how such decisions come about. They do begin to show the complexity that supposedly technical decisions can encounter.

In addition to these more rigid, instrumental and model-based studies, other scholars have moved towards more critical and interpretive studies of policymaking around biofuels. Critical studies, being similar to that undertaken in this thesis, have scrutinised discourses and actor-networks, multiple dimensions of the policy process and power and vested interests (Fortin 2011; Franco *et al.* 2010; Gillon 2010; Nagar 2009; Pradhan & Ruysenaar 2014; Sharman & Holmes 2010). These authors suggest that any assessment of the dynamics *of* the policymaking must interrogate the nature of evidence, not only how it becomes credible, but also that which is taken for granted when it is provided. As Sharman & Holmes (2010) highlight, for example, in their critique of the European Union's ten per cent biofuels directive in 2009, technical reviews and what the policies say are bound up in dynamic policy-based evidence gathering and biased relationships that are never mutually exclusive or automatic. These studies also begin to highlight that biofuels policies match other developmental policies, in which policy statements are usually the product of a compromise between potentially conflicting views and interests within an organisation or network of actors and as such they often deliver somewhat hazy policy messages (see also Cabral and Scoones 2006). It is then the job of the researcher to interpret how these come about, which is what I intend on doing for the South African case study.

Substantiating the need for interpretive assessments of policy, Douglas Torgerson (1985, pp.52–53) proposes that within policy (and in understanding it) there is:

> an internal tension, a dialectic opposition between knowledge and politics. Through the interplay of knowledge and politics, different aspects of the phenomenon become salient at different moments . . . the presence of dialectical tension means that the phenomenon has the potential to develop, to change its form. However, no particular pattern of development is inevitable.

This knowledge-politics interface can already be seen to set apart the types of reviews discussed above. The content analyses of the first axis and even the model-

based studies of the second axis are premised on the assumption that knowledge is predominantly positivistic and used in a utilitarian way to make policies better. The interpretive studies mentioned comprise a second category, which is far more critical and suggests that what counts as legitimate knowledge and the way it is generated are actually political activities.

To situate these two different categories better, in the next section I shall outline some theoretic understanding of the interplay between knowledge and policymaking from the instrumental perspective of knowledge straightforwardly informing policymaking to critiques of power-knowledge. I will therefore extend on the conceptualisation of policy briefly presented in Chapter 1 by expanding on the public policy process and its analysis from two main philosophical perspectives: positivism and interpretivism.[5] The discussion then moves towards a more refined outline of recent theories stemming from each of these philosophies, taking further the discussion on knowledge *in* and *of* the policy process. For the positivists, focus is on causality of decisions made and how these may be modelled. Interpretive approaches, which "search for subtle influences such as material forces, discourses, and ideologies that act so as to condition the content of policy" (Dryzek 2002, p.32), allow a much wider appreciation of the complexities of policymaking; they are equally pertinent to the biofuels strategy in South Africa. The theoretical discussion culminates in, amongst other issues, the meaning-making behaviour and social constructions through which policies are developed and legitimised, highlighting the importance of power and its extension from agency and structure to the realms of discourse and structuration.

[5] These two broad categories are by no means homogenous, with both being underscored by diverging schools of thought that, in the social sciences at least, remain deeply antagonistic in some respects. One should also take cognizance of Dryzek's (2002) post-positivist 'travelogue', in which the relative value of technocratic (positivistic) and critical (post-positivistic/interpretive) studies varies according to socio-political contexts (technocratic evaluations, for example, are more appropriate in Australia than in the USA) and depending on the problems confronted (technocracy is better suited to quite simple and well-bounded problems).

Policy research or policy-process analysis shares a common history with policy analysis (see distinction of Box 1, Chapter 1). Although appeals in the 1950s for a 'science' of policymaking within policy studies were broad (Lasswell 1951; Cf. Torgerson 1985),[6] the overbearing thrust of 'neo-positivist' or empiricist approaches, as Fischer (2003) describes them, crowded out other relevant policy research approaches. There followed a new enthusiasm for the instrumentality of policymaking. Polices, such as the 'War on Poverty', stimulated political scientists to study aspects neglected before, at a time when it became plausible to believe that public action could solve perennial social problems.[7] The challenge is that by focussing on technical rationality (both in research and analysis) these approaches reduce "emotional and conflict-ridden political questions by translating them into scientific and technical answers" (Fischer 2003, p.14; Fischer 2007). There was an obvious overlap, then, between rationalist conceptions of analysis 'for' the policy process and the positivistic research programme 'of' the policy process. Although cleavages remain, the dominant neo-positivist policy community, which reside mostly within political science and economic disciplines, is increasingly being matched by more interpretative approaches that draw on multi-method approaches across disciplines such anthropology, sociology, and a 'linguistic' turn following a focus on language and meaning as espoused by Jürgen Habermas (1981; 1989).

[6] Harold Lasswell (1951) envisioned a multidisciplinary enterprise and called for the study of the role of knowledge in and of the policy process. As Torgerson (1985) suggests, despite criticisms of positivist and technocratic dominance in policy science, Lasswell actually envisioned something closer to the post-positivistic suggestions that have emerged in response to such domination.

[7] At their most desperate, some of these social problems have come to be regarded, following Rittel and Webber (1973), as 'wicked problems'. These defy any definitive formulation, have no discernible completion (you do not know if or when the problem is solved), are value based rather than true or false, there is no immediate test of solution but rather 'waves of consequences'. There is limited potential for trial and error (or rather there are major consequences for inadequate responses with limited chances to reverse prior decisions); wicked problems are unique but may be symptomatic of other (wicked) problems, are determined, I would suggest, through social construction, which directs too the direction of their solution (or as the original paper outlines, the choice of their explanation determines the nature of the problem's resolution). Wicked problems have recently been subsumed within a wider literature around complexity and policymaking for complex problems (e.g. Jones 2011).

An Initial Mapping of the Policy Process

The essential point of the above discussion and one indicated by the different types of biofuels policy analyses above is that the notion of policy is inextricably linked to processes through which decisions are made. An original, overarching approach to modelling the policy process was one of separating it into discrete stages; generally considered as 'stagist' models or, as Sabatier and Jenkins-Smith (1993, p.1) refer to it, the "stages heuristic". When considered this way, the policy process is 'linear' and involves some degree of trial and error based on best available evidence. This instrumental view of top-down prescriptive policy provides a modelling of how things should work (Sabatier 1986), assigning the decisions taken by those with authority to do so[8] as a starting point and thereafter dividing it into distinct units or stages, such as: problem identification, agenda-setting, formulation, adoption, implementation, and evaluation (Sabatier 1986; Anderson 1994 cited in Koontz 2003 see also Hogwood and Gunn 1984). Such an approach implies that policymaking proceeds in a systematic fashion, starting at the beginning and finishing at the end. It is a model that has been critiqued over the past few decades as being inadequate to account of the complexity involved in making decisions, and it has been accused, at times, of confusing things more than it illuminates them (John 2012). Peter John (2012, p.28), for example, criticises the simplification of stagist models as being incapable of capturing the "change and messiness in public decision making".

Jann and Wegrich (2007) argue, however, that the situation is paradoxical in that the model is constantly criticized but frequently employed to configure both policy research and analysis.[9] Birkland (2001, p.223) also defends it, considering there to "still be life in the notion of stages" in that it helps structure thinking and piece together parts of the policy process. Similarly, deLeon (1999) suggests that before discarding it to the dustbin of abandoned paradigms we need to consider its value in imposing some order on an otherwise chaotic political process, drawing attention to particular decisions made and important outcomes amidst the complexity. A useful perspective with which to consider the value of the linear or stagist model is by

[8] This is generally referred to as authoritative choice.

[9] I too am guilty of this, given that my empirical narrative of the policy starts (somewhat) at the start and finishes at the end.

classifying it as a useful recipe by which policymakers and policy analysts make decisions—and indeed planning frameworks for analysis often prescribe such a recipe—while recognising that it is inadequate for explaining how and why such decisions were made.

Moving from the extreme simplification of the stages heuristic, Clay and Schaffer (1984) venture towards its polar opposite and despairingly consider the whole life of policy—at least in a rural development context—as a chaos of purposes and accidents. This conceptualisation obscures as much as the stages perspective, as it masks observable patterns of decision-making, that underlie such chaos and leaves open what the purposes are and how one might classify the 'accidents'. Additionally, while there may be life in the stages model, and without resorting to a chaos of purposes and accidents, scholars have considered the process as far more complicated than the linear view maintains with one group of commentators referring to it as one of disjointed incrementalism or the science of muddling through (Lindblom 1959).[10] The policy process can therefore be considered incremental, while also being highly nuanced and affected by social structures (institutions) and individual agency.

Once one acknowledges these complexities, theoretical understandings become equally cumbersome. Policy itself encompasses "a variety of institutional forms and practices in a range of settings" (Jenkins 2007, p.26); such practices include processes, activities or actions (Neilson 2001). John (2012) highlights that policy reflects the concrete decisions emanating from the political sphere, having specific outputs and outcomes, with identifiable participants, operating and negotiating within multiple institutional structures. Rudimentary definitions of policy are also deceiving in that policy and policy processes, what might be referred to as generic institutions of modern 'governmentality', "are 'political technologies', enmeshed in the relations of power between citizens, experts and political authorities" (Foucault 1991 cited in

[10] Lindblom (1959) provided an early critique of 'rational' decision-making in which he criticized the idea of decision-making as a comprehensive search for the optimal route to the achievement of known ends. He suggests that means and ends are not separable; analysis is normally limited rather than comprehensive; policy successes are achieved through incremental changes; and, that good decisions are not so much ones that achieve objectives but that people agree with the process through which objectives were reached (cited in Colebatch, 2009).

Keeley 2003, p.23). Policies are, therefore, inherently political, power laden, context bound and continually in a state of flux. Policy is thus an ambiguous concept, difficult to circumscribe in a single meaningful definition of public policy. As Bauer (1968, p.25) suggests:

> the making of public policy is amongst the most serious and important of activities of government, the complexity of the process and the difference between its intended and actual results renders it resistant to both adequate conceptualization and adequate research.

The situation is one in which the dynamics of interest "in policy are played out in a whole gamut of theoretical and observable spaces" (Jenkins 2007, p.8). Explaining causality in these situations, as I will discuss in the theory section below, has therefore taken on multiple frameworks, which include singular aspects such as institutions, exogenous determinants, rational actors or a combination of these, which are 'synthetic' models such as Sabatier and Jenkin-Smith's *Advocacy Coalition Framework* (ACF), Kingdon's (1984) *policy streams and windows* or Peter John's (2012) *evolutionary model*. This presents both challenges and weaknesses for policy scholars, opening up a range of theories to work with while confronting a widespread conceptual muddle.

As a social scientist, my general approach is one of researcher as *bricolier* in which one can expand from instrumental perspectives towards more nuanced and discrete interpretations of the policy process, building on the mounting evidence. This coheres somewhat with what John (2012) proposes in his book *Analysing Public Policy,* in which he builds on a range of theoretical proposals from policy studies. He insists, however, that causality or explanation be at the heart of policy studies and laments that these are generally discounted at the cost of description. Keeley and Scoones (1999), conversely, embrace and emphasise the importance of such 'description' as a meaningful way to understand the contingency of policymaking processes. As Steinberger (1995) maintains, the different typologies of the analysis of policy processes are not antithetical but rather reflective of the different descriptions that can be offered to elucidate and specify socially constructed meanings (see also Dryzek 2002).

Peter John's (2012) focus is, however, devoted to understanding how policies vary (between sectors and places) and their dynamics (stability and change) but his evolutionary explanation still cannot provide a rigorous explanation of the substantive factors involved. Incorporating ideas-based approaches—what he calls the "genie in the bottle"—suggests that investigators need to appraise the context in which ideas and interests constantly seek to dominate decision-making and interact with institutions, patterns of interest-groups and socio-economic factors that are slowly (and sometimes abruptly) changing overtime. Such an approach, and one to which I conform, reflects Pollit and Bouckaert's (2004) move away from the enslavement by a single theory. Their general stance is one of 'critical modernist' accepting the importance of empirically testing theories and hypotheses, although accepting that "this is only one kind of test, and that arguments concerning whether the appropriate conditions for falsification have been met will never cease" (Pollitt & Bouckaert 2004, p.23). Their focus is thus more of a radical modernity rather than wholly supporting post-modernity, whereby, they submit, "reality is socially constructed, but not all constructions have equal claim to our credulity and certainly some constructions prove more durable than others" (*ibid*). Nevertheless, such terms need to be situated within a much broader philosophical space before moving into detailed discussion of specific frameworks.

Philosophical and Epistemological Considerations in Researching Policy

The philosophy of research essentially asks questions of an ontological (e.g. what kinds of things are there?) and epistemological nature (e.g. what is the character of our knowledge or how do we know?) with the purpose of establishing what is 'true'. In modern social sciences, there are two overarching philosophies—positivism and interpretivism—that answer these questions somewhat differently.

Positivism has a long and rich historical tradition dating back to philosophers such as Plato.[11] It is so embedded in our society that knowledge claims not grounded in

[11] If one considers the sophists as early advocates of anti-positivism, it could be argued that interpretivism is no stranger to historical philosophical debates. That is an argument, however, that I am not willing to indulge. As with the rise to fame of positivism, the seventeenth century onwards is perhaps the more important intellectual background in which interpretivism emerged in response to burgeoning positivism. Prominent here was Vico, with his *verum esse ipsum*

positivist thought are simply dismissed as 'ascientific' and therefore invalid (Hirschheim 1985, p.33). Positivists[12] believe that reality is stable and can be observed and described from an objective viewpoint (Levin 1988). Given its success in understanding physical reality—establishing 'laws' that govern and can be used to predict natural phenomena—the objective approaches of the physical sciences appeared apposite, or at least were advocated for social explorations as well. By implication, empiricism—theories induced by observation—and later logical positivism—theories deduced by logical hypotheses and verified by observation (i.e. hypothetico-deduction)—were viewed as appropriate for social science explanations; although it was recognised that human phenomena were not identical to those of nature and the 'tools' therefore differed in social science. Ontologically this paradigm, and associated methodology, with its concern to establish causal or statistical relationships, necessarily reduces people and their behaviours to quantifiable variables. Social phenomena can be attributed to specific causal relationships, which can be isolated and observed repeatedly. Thus, epistemologically, testing hypotheses and objective knowledge claims reflect the philosophical belief that there is an external, objective reality and sensory experience is stable across contexts.

Interpretivists[13] argue there is no such objective reality and it is only through subjective interpretation that 'reality' can be understood. In a policy perspective, the "ontological and epistemological presuppositions include "phenomenology, hermeneutics and some critical theory from Continental Europe and symbolic interactions, pragmatism, and ethnomethodology" (Yanow 2007, p. 110; see also Fischer 2007). Although the various schools of thought differ, as they do in positivism, there is a general view that, even if the social sciences are to be objective,

---

factum, in which the truth is 'made' rhetorically (a precursor to constructionism), departing from the all-encompassing, hypothetico-deduction espoused by Descartes. (He did not entirely reject it, but questioned its applicability to the science of the civil society). Thereafter, hermeneutic philosophers (Dilthey building on the work of Schleiermacher) and phenonomologists, continued along similar veins of subjective understanding, in which humans were "purposive creatures whose lives were bounded by a reality which has meaning" (Hughes 1990, p.90).

[12] This section necessarily reduces a wide array of prominent philosophers, Bacon, Descartes, Mill, Durkheim, Russell and Popper, who while subscribing broadly to a positivistic paradigm by no means had similar approaches or ideas as to what this meant.

[13] In this paradigm too, there are countervailing thinkers such as Kant, Hegel, Weber, Marx, Freud, Polanyi and Kuhn.

they can only be through subjective accounts. It is here where theorists such as Max Weber, were less than apologetic for granting the 'interpretive understanding' as the distinctive form of knowledge and distinctive means towards objective knowledge (Weber & Parsons 2012). He thus considered the distinction between the physical and social sciences not as ontological but methodological, with the appropriate methodology being one of *verstehen.* There are also practical reasons why, for example, the hypothetico-deductive approach becomes problematic in social sciences. Experiments in social science are not as 'controlled' as in hard science and c*eteris paribus* assumptions do not hold true in social systems; our view of the world is theory-laden and we do not occupy a 'view from nowhere' (to borrow perhaps inappropriately from Nagel 1986). "Society is essentially a product of the human mind, is subjective, and emotive as well as intellectual" (Hughes 1990, p.90).

Both philosophies propose that the forces that impel social actors in their actions may not be known by them themselves, but may be retrieved through the deployment of some special and debatable method (Hughes 1990). In positivism, this called for empiricist methodologies and later hypothetico-deduction. In response, interpretivists called for, for example, methods of hermeneutics, historical materialism and *verstehen*. All encounter philosophical difficulties. In this thesis I do not seek to contribute to a long-standing epistemological debate within the philosophy of social science (and within social sciences themselves), over the validity of positivistic and interpretive approaches; I seek to emphasise the two may be compatible and even complementary as much as they are contradictory or mutually exclusive. Consequently, for the purposes of this thesis, both positivism and interpretivism need to be discussed with specific reference to 'policy' as both philosophies have provided important theoretical constructs and analytical frameworks with which to interrogate and conceptualise the policy process.

Positivistic Approaches to Policy and the Quest for Causality

The typical characteristic of positivistic approaches in policy studies, especially within political science, is that of identifying causation (John 2012), and generating laws concerning regularised human behaviour (Cf. Yanow 2007). The general aim is

to explain why decision-makers make the decisions they do; at its extreme trying to apply these explanations to persons at all places in all times. As positivistic approaches also have a propensity for measuring things, a quantitative[14] bias in explanations and an inclination for modelling, has become the basis through which policy analysis informs a "rational model" of decision-making. For the purposes of this thesis, however, it is not necessary to supply an exhaustive description of this extensive theoretical framework, however, a short description is useful as it introduces the reader to concepts and terms that are used in policy research and later in the thesis.

Frameworks, Models and Synthetic Approaches

In general, it must be remembered that theory in social science is usually based on claims about the nature of human action and power relationships, and seeks to provide a coherent and consistent account of reality. Sometimes the more wide-ranging theories are called frameworks. These "organise diagnostic and prescriptive inquiry" (Ostrom 1999, p.40). Individual theories developed within such frameworks generate models, which are more restricted assumptions about social and political relationships from which hypotheses can then be derived and tested (John 2003). Specifically, about policy, the stagist model described above is one such model; there are others.

Examples of what Sabatier (2007) might suggest as more useful models explaining the policy process, at least more than the stages heuristic, includes, for example, the Institutional Analysis and Development Framework of Elinor Ostrom (1999). In this model, physical and material conditions, attributes of community, and rules in use impact on an action arena (not entirely divorced from other action arenas) where actors make decisions as *homo-economicus* based roughly on rational decision-making processes with complete information and maximising expectations. Another is the Multiple Streams model in which there are three streams—problems, policies and politics—that flow through the policy system. These streams are largely

[14] This should not be taken to imply that positivism is quantitative and interpretivism is qualitative as such delineation between the two is inadequate and both can incorporate elements of each.

independent, except during policy windows (so-called windows of opportunity, usually instigated through the initiative of a policy entrepreneur). In these opportune moments, the streams combine to result in specific decisions being taken. Kingdon's (1984) multiple streams model proposes that problems are not uniquely identified but coalesce with other streams. As Jones (2009) notes, it is a process in which "choices seek problems and solutions seek issues, rather than vice versa". One could extend the metaphor of policy windows to one in which moments of intervention occur within certain 'policy spaces' (Brock *et al*. 2001; Grindle & Thomas 1991) such as within specific organisational and institutional contexts. Both are attempts to frame policymaking within spatial (though usually abstract or conceptual) and temporal boundaries. Gaventa (2006) further suggests that such spaces may be *inter alia* closed, invited, or claimed, with power within them being visible, hidden and invisible and that the type of physical spaces in which such windows occur are important for whom they bring together. I will raise the importance of the latter when considering actor-networks later on.

Within the instrumentalist and more dynamic realms of positivist research into the policy process, there are also a group of 'synthetic' frameworks—meaning they synthesise a range of theories—that are used to explain the way policies are developed and change. The 'Advocacy Coalition Framework' and 'Punctuated Equilibrium' are two of the major synthetic models that provide, more-or-less, a close working model of 'reality'. For example, in looking at stability and change in policy, which explores the dissemination of policy ideas through institutional and organisational sites and structures, the Advocacy Coalition Framework (devised by Sabatier (1988), Sabatier and Jenkins-Smith (1999), see also Mintrom and Vergari, (1996)) shows coalitions and policies as 'reactionary', which essentially brings stability to a policy subsystem. While attempting to explain causality, they also argue that policies are, however, a function of contextual aspects in which the policy process is situated. Mintrom and Vergari (1996), for example, examine four aspects that shape policymaking including scope of the community, the relevant timeframe, as well as the degree of structure in the policy-making process and the origins of

crises or incentives. Although not an exhaustive list,[15] the above theories and models suggests there are usually multiple causal factors, which defy easy simplification.

Another synthetic framework explaining the policy process is Peter John's Evolutionary model. In his book describing the model, John (2012; see also John 2003) provides an informative and more general overview of the process, in which the connections between models are left to the interpretation of the reader. He highlights how, to best 'explain' policymaking and its multi-faceted character, one could draw from existing political-science theories—broadly configured around five causal mechanisms, which include institutions; groups and networks, exogenous determinants; rational actors and finally ideas-based approaches. Each of these is contingent on the others and no one is logically or empirically prior.

While useful in confining dominant features that help explain how decisions are made, a great deal of the policymaking process is left unexamined in positivistic assumptions. From early theorising of policymaking within a 'bounded rationality' and policymakers being 'satisficers' (Simon 1957),[16] to more recent appraisals of ideas, norms and interests in neo-institutionalism (March & Olsen 1984), empiricist models cannot provide adequate explanation for something that is an inherently interpretive (and interpreted) activity (Fischer 2003). Peter John, as a leading neo-positivistic theorist working within the political sciences, considers synthetic approaches—his evolutionary approach being one of them—as the best means to "take into consideration the complexity, fluidity and changeability of the modern policy process as its baseline" (John 2012, p.183). However, he also admits that even his evolutionary theory attracts some of the criticism as other synthetic approaches… "in that sense the quest for a theory of public policy may never be completed" (2012, p.177). With such a shortcoming in mind, it is useful then to look at how interpretive

[15] The focus on how policies are made differs between disciplines and on the type of policy being made. Policy transfer literature provides another umbrella category for more specific types of policy innovation processes and the why and what of those processes. For example, Dolowitz and Marsh (14:26:20) draw out more narrow concepts such as policy diffusion, policy convergence and policy learning, also tending to reflect a more linear approach to the policy process. The nature of policy is, however, one in which different policy solutions, and problem streams need to combine at the appropriate moment for a policy to develop (Dolowitz & Marsh, 1996, 356; see also Evans and Davies, 1999).

[16] 'Satisficing', is a neologism describing the deviation of the 'administrative man' from being purely rational in decision-making to a point where satisfaction and sufficing are the bases for decisions made (Simon 1957, in Hogwood and Gunn, 1984).

approaches move between the strictures of these models, especially by taking a more critical perspective of knowledge and power within the policy process. Such approaches match the second major axis of (more critical) biofuels policy reviews outlined above, and correspond with the analysis undertaken in later chapters.

The 'Interpretive Turn' and Interpreting Policy Knowledge and Political Legitimisation

As policymaking can be considered a high-order cognitive activity (see Jenkins 2007) and includes an increasing array of people, interpretive approaches may be justified on the basis that actions are best explained in reference to 'the beliefs and preferences of the actor' rather than the search for 'logical or structural processes' that determine events (such as the rationality of markets or path-dependency of institutions). It has been argued that, "governing practices can only be understood through the beliefs, and actions of individuals located in traditions and in response to dilemmas" (Bevir & Rhodes 2003, pp.18–19). Colebatch (2009) similarly suggests that as more people emerge through various networks and ideas of government shift to governance, it becomes increasingly important to acknowledge what all these diverse stakeholders, with distinct and divergent understandings of policy problems and agendas for action, add to the policy process. That is, the object of analysis shifts from an 'objective' assessment of causation to understanding 'how policies mean' (e.g. Yanow 2007).

The Importance of Language and its Relation to Power

Interpretive approaches therefore interrogate policies from a somewhat different tack to positivistic ones. Amidst a plethora of 'isms', and 'posts', meaning is considered to be at the centre of individual and collective endeavours (Yanow 2007; Hodgson & Irving 2007a). Post-empiricism has evolved "as a critique in the way in which neo-positivistic theoretical approaches have been subsumed into "pluralism, rational-choice theory, neo-institutionalism, policy learning and advocacy-coalition theory" (Fischer 2003, p. 22; see below). However, the very nature of interpretive projects has made it difficult to turn them into a specific empirical project in the same way the positivistic studies have allowed. Thus, interpretive studies are diffuse, contextual

and utilise, in cases, vastly different approaches. Central to most—and following roughly in the footsteps of Weber's *verstehen*—is that policymaking is a meaning-making process in which there is a "discursive struggle to create and control systems of shared social meanings" (Fischer 2003, p.13; see also Stone 2002). Such meaning-making practices are informed by hermeneutic perspectives, which (Yanow 2007, p. 114):

> leads to a focus on policy-relevant texts, such as legislative records, agency correspondence, annual reports, minutes from community board meetings, and so on. Newspaper reports may also be data sources—as a kind of surrogate for interviews—providing contemporaneous accounts of key actors and their views along with more general sentiment at the time, especially for periods when the researcher was not or could not be present.

Following the linguistic turn of Habermas, language is also crucial in policy and central to interpretive approaches. As Fischer (2007, p. 238 citing Fischer 2003; Gottweis 2006) highlights, his classification of argumentative policy:

> links post-positivist epistemology with social theory and methodology and encompasses theoretical approaches such as discourse analysis, frame analysis and interpretative policy analysis. Although these different approaches are hardly synonymous, they nevertheless share the special attention they give to argumentation and language and the process of utilizing, mobilizing and weighing arguments and signs in the interpretation and praxis of policymaking and analysis.

Infused within meaning-making processes and the centrality of language (see also below), is the importance of power and knowledge, which are expressed through them. Habermas (1989) emphasises the importance of communication in securing and acceptance of the unequal distribution of power and the policy consequences that flow from it. Lukes (1974), in his radical response to pluralist theories of overt power (Dahl 1978) and theories of covert power (Bachrach & Baratz 1962) considers a third type of power, which involves the exercise of power to shape peoples preferences so that neither overt nor covert conflicts may exist but there remains a latent conflict. Foucault (1980) makes a similar argument through his understanding of discourse and 'power knowledge' but looks at diffuse mechanisms of power rather than Lukes 'dimensions'. A discourse is an "ensemble of ideas, concepts and categories through which meaning is given to phenomena" (Hajer 1995, p.44). In a policy sense, discourses impose frameworks that limit what can be experienced, or the meaning that experience can encompass, and thereby influence what can be said and done by the policymakers (Sutton 1999; Keeley & Scoones 2003). Discourses thus provide

"specific and distinguishable mediums through which communicative action takes place" (Purvis & Hunt 1993, p.485).

Language and discourse are of critical importance because the specific words chosen inevitably affect the subjects meaning or importance to ourselves and to those with whom one is communicating (people may also not decode the message in the way the communicator intends). Discourse encompasses or circumscribes the concepts and ideas relevant for policy, and the interactive processes of communication and policy formulation that serve to generate and disseminate these ideas (Schmidt & Radaelli 2004). These discursive structures (concepts, metaphors, linguistic codes, rules of logic, etc), often taken for granted, contain cognitive and normative elements that determine what policy-makers can more easily understand and articulate, and hence, which policy ideas they are likely to adopt (Campbell 2002).

Even the labels we give to phenomena determine what is told and untold; categories and classifications are then not neutral but indicative of the value system of the speaker or writer (Britton 2007).[17] As such, discourses and their counterpart categorisations shape certain problems, distinguishing some aspects of a situation and marginalising others. Important here is the use of language in policy-making and discourse analysis, the 'framing' of issues to be tackled and making policy solutions seem obvious and unquestionable. When considering framing and solutions there appears to be a bias towards finding tools to attack problems rather than trying to determine whether the problems have been framed properly in the first place (Keeley and Scoones 1999); one of the reasons solutions find problems rather than vice-versa (see above). One also has to acknowledge who controls 'framing' and how they do so.[18]

[17] Consider here the terms 'land acquisition' and 'land grabbing', which while both describe similar activities and are used synonymously, have entirely different political meanings and are derived from different biases. The former is a more neutral classification implying subtle nuances and is favoured by academics whilst the latter is politically charged having an implicit value judgement, and is readily found within radical (leftist) movement and civil society groups. Both allow certain issues to be discussed and set the mood for how they will be discussed and are understood.

[18] It is equally important to suggest that although this discussion is focused on communication and discourse in policymaking, policies themselves may also become 'frames' of reference and are as much a part of the discourse as they are a result of it.

Similar to labelling and classification is the notion of a storyline or narrative, which is used to frame issues. At their most ambitious, narratives can become 'blueprints' for development (Roe 1991), which are explicitly programmatic and in addition to identifying the nature of the problem, they provide the solution. The importance of narratives more generally is that they are an attempt to bring order to the complexity encountered when making policy (Rein & Schön 1993). Their effect is to bring clarity to a policy debate and allow for policy coalitions and a common understanding of the policy content (Roe 1991). As Du Toit (2012) notes:

> a successful policy narrative is one that manages to make the case for a particular course of action, but does so in a way that shows where this particular initiative or aim will fit in with a vast array of others; they have to create certainty (which is why 'evidence' is so important) and evidence can be used to 'rhetorically buttress arguments' rather than describe reality.

By limiting the room for manoeuvre and the expression of alternatives, narratives concretise policies, which, in effect, become hegemonic, doing the work of overriding discourses. To interrogate such issues, it is necessary to consider what narratives are encountered; how these narratives are formed, by whom and in/for whose interests. Similarly, as policies are both shaped and interest shaping, one needs to identify in what context these narratives are deployed and what impact this might have on the way policy proposals are envisaged. Importantly, policy stories are stories of 'what is' and 'what is to be done'. And it is the 'what is to be done' that is important because it needs to speak to issues of resources, overlap with departmental prerogatives, political marketability and the impact on political reputations, ideologies, common sense and so on.

Within the interpretive approach to researching the policy process, language is clearly important, not only as the basis through which social phenomena are conceptualised but also as a medium through which other activities are undertaken. Policies are, for example, part of on-going processes of negotiation and bargaining between multiple actors over time (Dobuzinskis 1992). Here politics is central to why and how things are done. Reflecting the importance of policymaking as a political practice, Sumner and Tiwari (2009, p.81), consider policy processes as largely concerned with power, primarily 'power over' (domination and control), but also 'power to' (agency and capacity to act), power with (support) and power within

(dignity and self esteem). There is ultimately an unclear line between those who 'make' policy and those who 'influence' policy; that policy processes are non-linear and highly iterative, and, evidence used in policymaking is contestable rather than positivistic or absolute. We have thus returned to the original dialectic between knowledge and politics within policymaking proposed by Torgerson (1986; above). Discourse, as we can see from the above, is an important feature of this interface but other factors are equally so. Some of these are outlined in the above models but those guiding my research specifically will be discussed in the next sections.

Knowledge and Political Legitimisation in the Policy Process

The importance of power as a crosscutting issue is one that many positivist theories tend to neglect, or at least marginalise, which makes interpretive approaches particularly useful, although power itself remains an elusive concept to theorise and model. As noted in the introductory chapter, and as the discussion of discourse suggests, power is more diffuse than pluralists and other political scientists would suggest and is bound up within knowledge making processes. From this perspective, discourse becomes one element of a wider framework of what Jones (2009, p.11) considers politics and legitimisation, in which:

> power is infused throughout the knowledge process, from generation to uptake. Knowledge will often reflect and sustain existing power structures, and is used in the policy process in processes of contest, negotiation, legitimisation and marginalisation.

If we reconfigure the analysis to one of knowledge in policy, we are able to trace some of these associated dynamics.[19] How knowledge and politics/power combine are then a function of various interlocking domains (combining theories above), which Jones (2009) and Keeley and Scoones (2003; 1999) summarise as political interests or groups, actor-networks, institutions and discourses. (It should not be neglected that what counts as credible knowledge is itself politically determined.) As I have discussed discourses at length already, I will summarise the importance of political interests and actor-networks.

[19] Keeley and Scoones (1999; 2004) isolate the three major directions of policy process analysis that may be used to draw out key elements (see also Cabral and Scoones, 2006): that policy reflects political interests, which are also representative of structural constraints on decision-making; that policy change reflects the actions or agency of actors within networks and that policy is a product of discourse.

As the name suggests, these approaches assume knowledge (at least rational or objective knowledge) as subordinate to political interests and particular types of knowledge prevail as a result of political interactions. The structure of the interaction and constituent interests are dynamic, with different theories developed to match these divergent circumstances. Keeley and Scoones (1999) isolate three dominant themes—society-centred following Dahl's (1978) pluralism, state-centred following Skocpol (1985; see also Evans *et al.* 1985; Cf. Jessop 2001), and bureaucratic highlighting the bureaucratic role being beyond just managerial but policy orientated as well. These themes have evolved into a more generalised framework involving 'network'-based approaches.

Different models of the policy process prescribe different relationships between key stakeholders—generally in terms of power over but also in terms of power to, with, and within (VeneKlasen & Miller 2002)—whilst also identifying the key players within such 'networks', namely, the state, bureaucracy, NGO's, the private sector and the citizenry (although the latter are often excluded in discussion and in practice). Common examples of networks include iron triangles (e.g. Adams 1981), advocacy-coalitions (Sabatier & Jenkins-Smith 1993) issue networks (Heclo 1978), policy subsystems (e.g. Jenkins-Smith *et al*. 1991) or as Colebatch (2009b) describes them, participants in collective puzzling.[21]

The importance of a network-approach to political interests within the policy process is three-fold. First, it reworks early precedence given to either 'the state', 'bureaucracy' or 'society', when theorising political power and domination in policymaking and rather obliges a review of the historical context in which these have come to overshadow one or the other. Different types of networks come with

[20] To avert any confusion a distinction must be made here from Actor-Network Theory (e.g. Latour, 2005) and what social and political scientists have called actors and networks or actor-networks. The former is far more specific and derives from the discipline of Science and Technology Studies (STS), whereby networks, which include non-human elements, generate and propagate certain types of (technical) knowledge especially. The latter is a more generalized term reflecting the importance of networks both as a whole and due to the actors within them.

[21] From a slightly different perspective one could also include epistemic communities, though I will get into a discussion of these later (see Haas, 1992; 1989; Chapter 6).

their own characteristics and relationships and differ between socio-political contexts. That is, it leads to an appreciation of "particular state formations [as would be important in the case of South Africa's young democracy], lack of homogeneity in the state and bureaucracy, political patronage and lines of affiliation that have formed over time" (Keeley & Scoones 1999, p.19). Second, network-approaches highlight the importance of interactions, bargaining and coalitions as processes (as described above) and, third, that knowledge results from core beliefs and the negotiated positions reached by political actors. Knowledge is then not the prime mover in policymaking, which emerges as a reflection of interests, although from where such interests emerge and whose interests are important cannot be taken for granted. There is equal overlap here with a widening focus on governance, which, when simplified proposes that governing no longer remains the occupation of just government (Box 2).

Box 2: Governance

The term 'governance' is employed across different disciplines and it would be wrong to claim homogeneity between these usages (Stoker 1998; Jordan *et al.* 2005). Jordan *et al.* (2005) highlight some consistent definitions from a political science perspective, which refer to governance as the shifting ability of the state to steer society, marked by a growth in multi-level government structures. Other pragmatic descriptions consider governance, as the "exercise of authority in a given area and a synonym for efficient management within a specific system" (Hewitt de Alcantara 1998). Alternatively, governance could signify "a change in the meaning of government referring to the new method by which society is governed" (Stoker 1998, p.17); which some consider implies a distinction between traditional government and new governance (Jordan *et al.* 2005). The new method of rule generally implies an increased role for non-state actors in policymaking and even implementation. This includes the rise of 'new' policy instruments driven by market mechanisms and voluntary agreements in lieu of the traditional legislative capacity of the state (Zito *et al*. 2003). It is generally accepted that the shift to 'governance' rather than 'government' reflects increasing power being devolved to non-state actors who now participate in a more complex 'heterarchy' rather than a system characterized by hierarchical 'command and control' or market-based 'anarchy' (Jessop 2003). However, many of these governance structures still rely on traditional forms of government regulation (Folke *et al.* 2005; Peters 2011).

To extend a policy, research project, or development initiative to other spheres, networks require actors who are protagonists or 'policy entrepreneurs' (Hart & Victor 1993). These actors play crucial roles in publicising an issue, succinctly defining the urgency of a problem and offering the possibility of a solution (Keeley & Scoones 2004). Whereas networks imply association, actor-orientated approaches prioritise individual agency over and above that of structural collectives or aggregate interest groups in which they reside. Shifting the focus to individual agency moves away from macro-processes in which particular forms of knowledge dominate as a result of political bargaining and the exercise of power between groups, and suggest that the micro-level is also composed of the practices and actions of multiple interacting actors within groups; actions are not only limited to those of rational *homo-economicus*. Political interests are equally important here as, often policy proposals emerge from the decisions of one or more powerful actors.

Beyond individual interests, agency should also been seen in terms of knowledge creation. By this, attention has to be focussed on activities at "knowledge interfaces" in which "new forms of insight and action, and new directions of the policy process" may emerge (Keeley and Scoones 1999, p. 20 citing Long and Long 1992; Mosse *et al.* 1998). Policy entrepreneurs and their 'interpretative communities', for example, allow for additional 'enrolment' but such actor-networks are important in developing knowledge in the first place (Latour 1996). That is, by drawing on Latour's Actor-Network Theory and other theories from the science studies literature, one recognises the micro-details or simultaneity of network formation and knowledge formation. By acts of 'translation' through chains of persuasion and influence, "scientific facts are only as strong as the networks that uphold them" (*ibid*; Cf. Yearly 2005; Chapter 6). Networks are therefore generated by and generate knowledge, and are part of a process that may be deconstructed to expose its constituent parts.

The above discussion of knowledge generation through actor-networks emerges largely from Science and Technology Studies (STS) and related 'Science Studies' disciplines. I consider the STS literature further when considering evidence-based policy in Chapter 6, so some background is useful here, as it draws attention to the uptake of knowledge in policymaking in general. Of particular relevance, social

studies of science interrogate the assumed independence of science/knowledge and policy, illustrating how the two are co-produced (Barnes and Edge 1992; Jasanoff 1996; see also 'mutual construction' of Shackley and Wynne 1995) and often used to sanction or legitimise each other, or exist in the absence of one another. Weinberg's (1972) 'trans-science' is one example here, in which policies are usually developed before the science is complete (or asks questions beyond science's capabilities) and thus policy is made in the face of continuing uncertainty (see also Yearley 2005). Ultimately, knowledge is neither 'unproblematically' incorporated into the policy process, nor is science the bearer of truth, presenting clear evidence to resolve identified problems (Keeley and Scoones 1999).

Policy Development the Role of Policy and Policymaking in/for Development

Having discussed some of the main theoretical perspectives of the policy process, which guide the research in later chapters, in this section I briefly show some of their importance to research into development policy. According to Mosse (2005), who bridges science and technology studies with development studies, it is possible to outline three major schools of thought when discussing policymaking in 'development' (these roughly but not exactly coincide with some of the theories of policy described above). The first is an instrumental view of policy, which tends to see policy in its own terms as the rational assimilation of evidence and best practices that is then communicated to the implementers. Development policy in this context is the application of technical solutions, which, through continued monitoring and implementation, are adjusted accordingly to ensure outputs and (more difficultly) outcomes are met.

The second perspective is more critical of development policy and is part of a wider discussion around the social construction of 'development'. Proponents in this school aim to uncover hidden agendas of neo-colonial control, economic exploitation and the export of western ideologies hidden within policies (see Escobar 2012). If one takes a less radical approach, this critical perspective also raises important considerations of discourse and received wisdom in the policy process (Cabral & Scoones 2006; Keeley & Scoones 1999; Roe 1991; Sutton 1999) as described earlier.

These considerations urge the analysis of knowledge-power that may make policies technically impeccable and institutionally provocative—they speak the right language—but remain bounded to the discourses through which they were created (Ferguson 1990). A synopsis of the 'development apparatus' developing policy, as outlined by Ferguson (1990), suggests:

i. development institutions generate discourses;
ii. discourses are constructs or a particular kind of object knowledge; the discourse creates a structure of knowledge around that object;
iii. interventions are then organised on the basis of this knowledge, which while failing (as they do not match particular realities) have alternative or regulatory effects (described by Ferguson as the expansion and entrenchment of bureaucratic power in Lesotho).

Ferguson thus refers to this development apparatus as an 'anti-politics machine' that, while considered apolitical, still performs a political function. The complex relationship between the intentionality of planning and the strategic intelligibility of outcomes is perhaps the single most important theme.

The third school of thought draws on ethnographical studies of bureaucracies and policymaking, for example, interrogating further the constitution of Ferguson's 'complex relationship' and dissecting the intricacies of Ferguson's three steps. Drawing on the work of Bruno Latour (1987; 1996), Mosse (2005; 2004) situates himself apart from the first two interpretations above and focuses far more on the complexity of policy as an institutional and social practice, opening up the 'black box' of implementation. From this perspective, greater attention needs to be given to the 'social life' of projects, where the organisations and professionals, diversity of interests behind policy models and the perspectives of actors themselves all need to be considered (Mosse 2004, p.644). While much of his argument complies with that of existing sociological interpretations of the policy process, and hints at an overarching structuration argument, David Mosse reorders the process and makes us consider why 'good policy' is 'unimplementable'. Here he argues that discourses become the end, rather than the means, of development because coherent and attractive development discussions create a far better framework for 'maintaining

relationships' than contradictory development realities. By this, networks take on a character not held together by a particular discourse (such as they are in advocacy-coalitions) but are actively rearticulating it.

Based on his research, Mosse makes five propositions about policy in development. The first two maintain that policy functions to mobilise political support and legitimate (rather than orientate) practice; while development interventions are driven instead by the exigencies of organisations and relationships (Mosse 2004, p.648-54; 2005, p.14-17). That is, development workers do what is required according to local demands while policymakers focus on political alliances. This too has been recognised in bureaucracies in general (e.g. Dalton 1959). When development policy works well, it is because local players are able to reinterpret their practical activities to be expressions of policy, and policy makers are able to present the results of local action as policy successes. The third proposition is that an essential part of development work is maintaining this overall system of representation, not just technical and operational matters (Mosse 2004, p.654-58; 2005, p.17-18).

The fourth and fifth propositions deal with the ways in which successes and failures are portrayed within policy. When projects fail, it is because 'policy' has failed them. Essentially, changes in policy also change the discourse but not the action on the ground, so that what was previously successful is now by definition a failure; even if there have been no changes in implementation (Mosse 2004, p.658-61; 2005, p.18-20). Successes and failures are measured against policy, which obscures the effects of actual projects (Mosse 2004, p.662). In the end, policymaking, unlike project management escapes accountability. "Perhaps good policy is not implementable, but it is absolutely central to what happens in arenas of development, and it is important to know how" (Mosse 2004, p.667; 2005, p.20). Policy is also more important than we think because it operates at levels of power and influence, which are driven by other forms of motivation than its ostensible object, which in Mosse's case is good development practice (see also Keeley and Scoones 1999; 2004). I reflect on such a situation in the concluding chapter by emphasising the symbolic nature of policymaking over and above the instrumental.

The anthropological approach Mosse advocates can further identify far more nuanced and subjective reflections as to how policy happens – in fact becomes the discourse. The approach is considered relevant for my purposes, to begin to assess the credibility of 'biofuels for development', and the appropriateness of technical approaches to 'development'. Essentially, in the case of biofuels, in South Africa I suggest that it is important to consider discourse as being both a means and an end, identifying how they have gained prominence and the manner in which their currency is maintained. In the next section, I will outline how exactly I do so.

PUTTING THEORY INTO PRACTICE: THE RESEARCH METHODS

The methodology and focus of this study have evolved over time. The nature of these changes is important and enables the reader to understand the research objectives described in the introduction. Following an initial literature review and desktop assessment, two main areas of concern were the development of the final Biofuels Industrial Strategy document, and the issue of how the strategy's objectives matched with 'successes' on the ground. While the latter appears extremely instrumental, it was not to be a simple 'gap analysis', but rather an enquiry into how projects framed activities (and their success) in response to, and as part of the emerging policy framework. At the time of writing my original proposal in Edinburgh, there were a couple major biofuel projects being proposed in South Africa, which, I assumed naively, would be 'established' in a matter of months. After a first research visit to the South Africa in 2009, however, it emerged that biofuels projects were relatively non-existent as the industry was awaiting some serious policy changes. An interview with a representative of the South African Biofuels Association[22] sums the situation:

> [Interviewer] I am interested in discussing the biofuels industry in South Africa.
>
> [Respondent] *Biofuels industry … What biofuels industry?* (SABA respondent, 2010).

[22] This 'industry' association later changed its name to the South African Bioenergy Association in response to the widening set of activities of its members.

In one sense, such responses serve to contrast the exaggeration apparent in magazines, online and in the news, with the reality of the situation. However, the lack of projects made the investigation into the policy process and its influence on the wider 'industry' more pressing (and interesting), especially given the business-centric lobbying, before the *final* Strategy was promulgated. Meeting with some respondents, who would, I think, not object being called 'lefties', their interpretation seemed to suggest the entire policy process was about 'greedy' maize farmers trying to make huge profits by selling maize to ethanol producers, who were then undermined by the ANC. It was a believable story, one echoed by the press and headline-catching debates of food-versus-fuel that have been ongoing (see Chapter 7), but the process was far more politicised and multifarious. It presented fertile ground for an interpretive investigation of policymaking. Indeed, maize farmers were important, and their hopes were certainly dashed when the final policy was released, but they were not the only players. They were actually, relatively insignificant compared to the government actors, the quasi-governmental organisations of the Central Energy Fund and Industrial Development Corporation, amongst other project-level players. It was not only the maize farmers that have been sidelined (even though their fate dominated the biofuels discourse at the time) but also the industry in general. For this reason, I embarked on a 'post-mortem' of the industry (see Table 3 of Chapter 5) looking specifically at how these other players were involved and interacted with the policy process and its development; considering them as policymakers, rather than outsiders awaiting further guidance.

Through the review of external (non- and quasi-government) players and the interaction and overlap of the 'policy' and the 'industry'—not in terms of actual project activities on the ground but rather the activities of key role players—I began mapping out the policy subsystem and its links to the development of a biofuels assemblage in South Africa. (Although there is value in documenting the rise (or demise) of the new fledgling biofuels industry and its relation to policy, for the purposes of this thesis, I do not detail this emergent assemblage, except where it ties in with the policy's development. I also limit the study to the development and promulgation of the *final* Strategy, although this is by no means the end of the story.) As such, an iterative and qualitative analysis (see below) was undertaken, both at

national level and within the Eastern Cape, where two major biofuels projects were and continue to be proposed (a map of these can be found in Chapter 4). These projects are the Industrial Development Corporation's vanguard Cradock sugar beet-based bio-ethanol plant, and a German-sponsored canola-based biodiesel project in the former Transkei. In addition, I also met with a range of other stakeholders and project managers involved in other defunct and/or slowly progressing (small and large-scale) projects, most notably the Mabele (sorghum) project in the Free State, which is now the leading private-sector initiative in the country. With an important policy entrepreneur on their team, this project remains equally important to the policy's continuing development.[23] These interviews were used to bolster the discussions with government officials involved in the policy processes, which are described next.

Methodology and Methods

The overall methodology was developed through a literature review and understanding of best practices developed within the original research proposal. This research uses a number of research techniques to obtain, assemble and interpret information germane to the inquiry. The two main methods were:

- Interviews with key stakeholders in which their testimonies would be used to identify how people perceived the policy process and its changes over time.
- Discourse and content analysis in which key texts and policy documents were analysed with respect to the rhetorical claims made, narrative framings and their relation and meaning to context. This included interrogating national and local policies and relevant 'grey' literature.

In addition to the original literature review, which set out the wider context in the proposal stages and informed the conceptual underpinnings and analytical framework, content analysis continued to inform much of the research. While a quantitative approach to textual analysis has not been followed (eg Sengers *et al*.

[23] A full discussion of these projects is provided in Chapter 4 as they form part of a complex web of government and non-government actors and organisations and their discussion falls better within the empirical narrative.

2010), content has been reviewed for recurring or prominent themes and the socio-cognitive frames through which they are drawn; largely revolving around modernising techno-economic rationales but peppered with aspirations of ecological and social improvements. Key to this approach was also looking for rhetorical claims that departed from or were contradicted by dominant themes within the texts that they appeared but also clarifying who were crafting such texts and thus making inferences about the characteristics and effects of such communication. For example, the Feasibility Study (see Chapter 6) is riddled with such contradictions. The executive summary, for example, suggests a wealth of benefits (ecological modernisation and social upliftment in the second economy), whilst the actual content of the document denies and contradicts such possibilities.

Media excerpts were especially important in identifying some of the popular discourse around biofuels, topics of central importance, and the wider public interest. Research documents investigating biofuels in South Africa have also been important in both setting the scene and highlighting prominent discourses and conceptual frameworks used in justifying and legitimising support. The examination of key national policies, for example, Energy White Papers and strategy documents of the Department of Energy (and its forerunner the Department of Minerals and Energy), Strategic Plans and programme documents of the Biofuels Task Team, and provincial documents, especially regarding the Eastern Cape's own policy developments, was undertaken to supplement the interview data. Reviewing these documents not only provided clear outlines of the strategies being researched but also helped to situate the Industrial Biofuels Strategy in wider energy and development policy frameworks. The various strategy documents also outline institutional arrangements and procedures that are used to inform the interviews and the findings. The documents are described in their relevant contexts within later chapters.

With some understanding of the policy context, as mentioned above, in 2010 I embarked on a six-month fieldtrip to South Africa. Sampling for the research was non-random (Kelley *et al*. 2003), purposively seeking out experts in the population being considered. In general, such sampling may be criticised because it results in an

inherent bias. Non-random sampling is useful, however, when descriptive comments about the *sample itself* (in my case the policy subsystem) are desired. As an idiographic and interpretive enquiry into the development of the Strategy is the basis of the assessment undertaken here, non-random sampling is considered a valid approach for the research. The main interviewees chosen were from government sectors (primarily main members of the Biofuels Task Team), as well as academics and consultants in the field. Use was made of 'snowball' sampling, commonly applied in stakeholder analyses of development projects (*ibid.*, see also Grimble and Chan 1995). In this type of sampling, key informants help to identify others with knowledge and information to assist in the understanding of or involvement in the topics being researched. I recognise that the inherent bias in this approach may indeed leave certain players out (and certainly, some important stakeholders only emerged through document analysis, media interviews and other means) though it is still useful to discern associated networks or an anecdotal 'who's who'. The resulting stakeholder analysis is cross scalar, moving from national to local levels and between (see Appendix B for a list of informants). At the national level, nearly forty interviews were concluded with respondents who predominantly had a direct involvement in the formal policy process, either as consultants or as government officials, or whose activities were closely related to the Strategy's development.

Initial interviewees were from the national Department of Energy (DoE), as they were the controlling or co-ordinating entity of the Biofuels Task Team. Interviews with the DoE and other members of the Biofuels Task Team were deemed sufficient to give an adequate representative overview of the status and some of the processes of developing the Biofuels Strategy. These semi-structured interviews were iterative, with ideas continuously adapted to the needs of the research, as further understanding of interviewees, the institutional environment and key points of interest were grasped. This was consistent with the organic nature of qualitative interviewing (Babbie & Mouton 2001). These preliminary interviews were then used to map wider research activities and provided additional inputs and data (documents as well as correspondence notes and government policy reviews) for the analysis.

In this first fieldtrip in 2010, a number of challenges were encountered. Most notable, was that most of those people involved in the Strategy's development were no longer in the same positions they held at the time (the final version of the strategy was released in 2007) and were therefore difficult to locate. This meant time available for research was lost in the search for informants. Those that were still available were, in many cases, no less difficult to meet with and thus a second fieldtrip in 2011 was arranged to address this issue and gather more data. These and further interviews with 'industry' players were completed in this second fieldtrip. The latter interviews also included a two-month field trip to the Eastern Cape to engage with key stakeholders within the Province, as well as meet the project managers and wider community of the Cradock ethanol plant.

The research primarily relies on the use of semi-structured stakeholder interviews as part of the case study approach. As this research project is only an initial study, qualitative interviews were deemed sufficient to gather the necessary data. While questionnaires and other quantitative procedures would certainly bolster the research, given the flux of people within the department and overall interpretative focus these were not undertaken. Interview content was either recorded and transcribed (where respondents did not object to being recorded), and/or notes were taken during the discussion and important points summarised after the interviews. Interview summaries were coded using QSR Nvivo 8 software, for qualitative analysis and easy reference. The coding system was *ad hoc* and iterative, being adapted as new themes emerged in new interviews (also resulting to re-analysis and coding of previous summaries). There were of course overriding themes guiding the interviews (Appendix B; below). The coding in Nvivo was useful for three main reasons. First, it was instrumental to the analysis by allowing quick referral to themes as mentioned above. Second, the Nvivo coding was used to annotate topics requiring further questioning in future interviews, which were then incorporated within the interview questions where applicable. These would include both issues that were not fully understood (requiring clarity) and new topics that had been mentioned but were not known about but appeared interesting (required exploration). Finally, the software was also useful to keep track of key stakeholders to be interviewed as part of the on-

going research, given the orientation towards 'snowballing'. That is, people mentioned in interviews could be coded to ensure follow up was taken.

All interviews were conducted in English and all officials had a good understanding of the jargon and technical content involved in government programmes. I managed to establish a good rapport with many of the interviewees, some of whom I have sustained contact with given our similar interests. The semi-structured interviews were designed *a priori*, according to various topics depending on the nature of the respondents (national, provincial or local) and the themes to be addressed (see Appendix B). General guiding themes were maintained for each sub-set of stakeholders, allowing for some comparison across interviews. The semi-structured approach to interviews was chosen given its flexibility to permit a more open dialogue between interviewer and respondent. To reduce researcher bias, questions were kept as simple and straightforward as possible and allowed for much latitude and personal discretion on the part of the respondent, however, obviously certain points were prioritised and emphasised. In all discussions, I generally focussed on (i) how people fitted into the process but also (ii) where they came from organisationally or in terms of their professional background, to understand why or how they thought about issues that were confronted in their negotiations and what their focus areas were. The emphasis was not just about finding out what they wanted to achieve but why.

In summary, semi-structured interviews were undertaken and analysed using Nvivo to see how people and their associated institutions/agencies/projects were involved in the policy process, obtain their views on how the process unfolded, who they thought were important to the process, as well as other themes specific to the biofuels policy (for example, their views of food-versus-fuel, where they see the greatest challenges, *et cetera*). The analysis also considered the knowledge respondents' cited for their arguments, which adds to the discourse analysis and an understanding of narratives at work. Additionally content analysis is used to interrogate the nature of knowledge in the media and policy documents to determine how these influence or are represented within policy.

Reflecting on the Research Approach: Some Procedural Strengths and Weaknesses

A value-critical approach to research insists that the 'positionality' of the researcher is not taken for granted, that research is never purely objective (approaches are always theory laden and/or subjective) and meaning-focussed analysis is always highly contextualised. Inherent weaknesses in the interview process were acknowledged and in some cases explicitly encountered, given the racial, socio-economic and demographic characteristic of the researcher (white, male, middle-class, English speaking, experience as policy consultant *et cetera*). Being white in the new South Africa is a particularly thorny issue, especially when it comes to researching the 'new' government. Preconceptions and racial tensions can direct responses and social conduct, at its worst confronting open racism from all quarters and at its more subtle pigeonholing and pre-classifying discussions into somewhat polemic rhetorical categories of white-versus-black, us-versus-them, old-versus-new. This was not always the case but it is important to recognise that as a white male talking to mostly black (often female) officials, who have lived through the tribulations of apartheid, one is left trying to internalise different perceptions with, perhaps, varied success and an uneasy sense of self. Overall, however, the impact on the findings and indeed the interviews was limited, given the rich data and discussion provided, and it is likely that one can overindulge these subtleties in lieu of a more straightforward and uncontroversial research programme. The rapport gained between researcher and respondent on most occasions was indeed a sign of the absence of any racial tension or 'baggage' and an eagerness to 'get on with the job'.

In hindsight, the initial decision to attempt an in-depth study into the policy-related dynamics of both the project- and policy-level, left questions remaining in each case. It is unlikely, however, more interviews were possible in practical terms given the time available to undertake the research.[24] Had documentation been more accessible, especially that of meetings held by the Biofuels Task Team (the main policymakers),

[24] This is perhaps the greatest limitation when researching government policy in a specified timeframe. Twice, involving two separate (but key) informants, I travelled over 500km to attend meetings that were cancelled due to unforeseen circumstances (in which political superiors had requested meetings 'that morning'). One can see how quickly time runs out. It was also difficult to arrange telephonic interviews, which usually resulted in similar outcomes when they were confirmed.

as well as communication between the various stakeholders (especially project-managers), this may have necessitated fewer interviews, better background information to draw on and more time for additional or repeat interviews. However, this was not the reality or the situation and such documentation has not been forthcoming. At the same time, the dismal performance of the industry made research at the project level relatively difficult. People were frustrated with anything to do with biofuels and the discussions were difficult to explore given that, frankly, the policy was a 'failure' and there was not much more people want to say. I have also had to be circumspect when interrogating the project level. There were, for example, interesting histories to be documented regarding projects in the North West Province but these were left aside for a greater focus on the projects in the Eastern Cape, as they were more instrumental to the national policy process. As such, questions remain, as do issues to be addressed concerning the relationship between projects, policymaking and policy implementation as a continuing and dynamic process. From this research, it is apparent that the Cradock biofuels project is a useful basis for exploring the development of the industry during and after the initial five-year pilot phases. Some of this data has been incorporated into the thesis but this only touches the surface of an extremely peculiar project (see Chapter 4 and its associated Appendix D). The same is true for the proposals for canola (oilseed rape) plantations in the Eastern Cape, a case study to which I hope to return. The nuances of these project-level assessments are especially interesting when viewed in relation to the existing theories of 'global' biofuels commodity chains, or assemblages, as local contrasts and similarities can be used to tease apart some of the theoretical standpoints in novel ways (see Chapter 8).

There was, however, value in taking both a policy and a project approach given their complementary role within the overall policy process. For example, in a brief visit to the Eastern Cape in the first research phase, I ventured to find out more about the policy that was drafted in the Province. Although I gathered limited data—despite the commendable support of some of the main government officials involved—the discussion of where the policy came from only made sense after interviews a year later with project managers of the Cradock Plant and the Phyto*Energy* project (see Chapter 4). Here, there was early interaction between the project managers;

especially of the Phyto*Energy* (or rather KPMG) representatives that had began to spur interests in biofuels. This does not mean that the policy was only due to the activities of the project managers. Two of the policy-makers involved in developing the Eastern Cape's policy had been to conferences (one of the few groups of people that actually succeeded in the 'early days' of biofuels were conference organisers and consultants), which had also struck a chord with their own departmental or developmental interests in the Eastern Cape.

As the analysis of the processes is subjective and based on the accounts of others, there is an inherent potential for participant bias and incomplete/censored information. However, respondents clearly underscored their vested interests, detailed surrounding networks and were open about their ideologies and frames of reference, which not only brought any bias to the fore but assisted in understanding how or why the policy process was steered in such directions. People were quick to suggest that what they were telling me was only *their* interpretation, one worldview amongst many, and prejudiced by their own lived experiences. Far from being a weakness, this is exactly the information I was attempting to grasp and it was not only policymakers that divulged such data. Commercial farmers in the Eastern Cape were, for example, apologetic of their self-professed naivety when it comes to politics and their ideological predispositions that favour commercial farmers over and above other types of farming. People within 'the industry' also suggested a range of criteria they felt were important for a biofuels policy but that what happened did not conform to their own understandings of the way things 'should be done', though to varying degrees they understood that this was only one way of thinking about the way things 'could be done'. As one respondent stated in a particularly gruesome metaphor, "there are many ways to skin a cat".

A third important issue, was that of accessing the formal and informal activities, and the 'on the record' and 'off the record reports' of key stakeholders. Although respondents have been wilfully open about the policy process and their role in it, much if not most involvement was informal, or at least, not formalised. As one of the consultants I interviewed suggested,

> *Shaun, there is lots to go on here, but there is no paper trail for you to follow, none of this [negotiations between and with officials] is written down… and if you were to ask people their official position, it will never reflect what has happened in reality* (Consultant A 2010).

With some frequency, a few interviewees suggested there was the 'real story', and an 'official story'. In such cases people, would say, "don't quote me", followed by what was generally the most important information, tying together how and why certain decisions were actually made. In many of the discussions, especially when for clarity or in follow up, respondents became much more frank, as better rapport was established between the respondents and I, allowing 'secrets' to be divulged. Countless times, I was told, "this is off the record" and then told of the day-to-day arguments and petty politics that people within the process had encountered. These came to be important in understanding nuances and contradictions that only made sense after the benefit of learning such 'secrets'. They were important too as many policymakers would also indulge in 'rants' about their frustrations with the policymaking process but that gave a more personalised sense of the process, many that resonated with my own experiences as a consultant. To test the validity of some such accusations and anecdotes I would try and include them in other interviews—asking whether they were plausible, cynical, ridiculous—and gauge the kinds of responses. The consistency between responses suggests that there is some authenticity to their views; at the theoretical level, there is much more to be worked out behind the smoke and mirrors in areas where academics (and journalists) have little access in South Africa. Most of the time, what I thought was pure cynicism was closer to the truth than I had expected.

It should be recognised that the research attempted to unpack the policy process, including the knowledge-power component, historically. The passage of time between the research undertakings and the actual promulgation of the policy has meant that people did not always clearly remember what happened when, or that they were fuzzy on the sequence of events. It has meant, however, that people have been open in their discussions, as there is now sufficient distance between them and the strategy. This is not true of some respondents that are still actively involved in government and in the projects. Key stakeholders in this regard have continuously

rejected or ignored requests for interviews and discussions. Certainly many of these stakeholders are busy as many are 'high up' within government structures and therefore carry heavy responsibilities. At the same time, some have refused out-right, illustrating the sensitivities surrounding the biofuels policy, the fragile negotiations around 'implementation', and in some cases a political reluctance to engage in 'difficult' conversations. From the above, it was at times difficult to separate analysis type processes and data collection and as such I would continually reflect on interviews and take notes of what I thought were interesting relationships between the interviewee and the wider biofuels assemblage or policy sub-system. Who was open to discussion and who was not was also important as it essentially reflected groups of 'untouchables' but also limitations in what data I had and how I might be able to work around such limitations. Unfortunately, it is well recognised in policy analysis that there will always be limitations as to what data is made available (e.g. Hill 2005, p. 10). The political hierarchy were especially difficult to establish links with, generally referring interviews to subordinates and technical staff. Out of five ministers approached, only one availed their time.

Another weakness to be considered relates to the interviews themselves though also had minimal impact on the findings. May (2001) considers that three conditions are necessary for the completion of effective interviews. The first is accessibility – whether those interviewed have access to or possess the relevant understanding or information to enable them to respond. Only in some cases were respondents unwilling to respond to questions, but it should be noted that this was usually for ethical or political reasons on the part of the respondent rather than them not understanding the questions. The second success criterion is cognition of the respondent's role within the research. All interviews were preceded by an introductory discussion and the reasons for the interviews. Part of this approach was to emphasize the importance of the interviewee's involvement but also to clarify or rather guarantee anonymity[25] and ensure no one would be put at risk by being

[25] As many people involved in the research are still involved in biofuels policy processes and the wider industry, I have elected to not name specific respondents when using quotations but rather replace names with interview denominations such as (Interview A, Interview B, *et cetera*). This provides some measure of consistency of who said what but will also be supplemented with some mention of where they from but be general enough not to allow their identification.

involved. When engaging in informal open discussion with informants (for example, informal discussions with officials while at conferences or workshops), information that was used was not referenced to any specific individuals so there is no risk to those involved. Finally, it is also important to motivate respondents to feel that their involvement has been of value. All respondents were assured that their contributions were valuable, and it was evident from the eagerness shown by most government officials interviewed that they were interested in the research. Only in rare cases did individuals refuse to become involved. In some cases, it was unfortunate that no contact could be made.

One has to emphasise that this thesis can only ever hope to present a partial view of the process, and perhaps even only a partial view of an extremely complex policy sub-system. Even those closely involved have had different interpretations and recollections of 'how things happened' and thus my work is to present as full a picture as possible and mediate supposed contradictions. The analysis can never be an entirely complete one. Equally, the more the subject was researched, the 'messier' things became. Although a weakness, acknowledging this *messiness* also presents an opportunity. As research in similar areas has shown (du Toit & Neves 2007; du Toit 2005), reality is complex and it is especially the local circumstances that need to be unpacked, rather than relying on idealistic metaphors that serve to mask and obscure the true nature of things. Roe (1991) notes similar shortcomings in development policies based on arguments, scenarios and narratives that do not stand up under scrutiny. The abstractions of policies and even my own analyses of power-knowledge, narratives and networks serve to reinforce that there is always more to be looked at than a blind submission to the simplicity of policy proposals, whilst also recognising that such analyses themselves will be necessarily incomplete. We should be continually searching amid the veils of glib rhetoric for the wider 'truth' and hidden details. It is through the above empirical processes that the attempt has been made to accomplish such a task.

CONCLUSION

This chapter began by reviewing existing biofuels policy analyses. Two categories are apparent. The first comprises situational reviews or studies *for* the policy process, often prescribing recommendations to make policies better (both in terms of content and often proposing the processes through which they should be made). These types of studies take an instrumental approach to policy and policymaking. Analyses within the second category are more interested in the process *of* policymaking than the content. Here, two more distinctions could be made between those studies that model and theorise the process from more positivistic approaches, which also assume an instrumentality of positivistic knowledge, and studies that are more critical and interpretive, which are critical of knowledge as part of wider social constructions and power relationships. These two distinctions within the second category are indicative of a philosophical divide within social science in general and policy studies in particular. Policy and policymaking are therefore difficult to define in detail, without entering into particularly complicated and contentious debates. Nevertheless, the chapter has highlighted an overall theoretical framework for the thesis, defining the overarching philosophical position, of which my research follows the interpretive and critical approach. It thus deviates from positivistic assumptions about the social sciences and positivism as a basis for policy process analyses. This implies that I consider there to be value in considering subjective accounts in policy studies and that we cannot objectively know and precisely prescribe causation to decisions made and knowledge used within policy is equally open to critique.

The discussion then elaborated the epistemological and theoretical perspectives that such a philosophical position entails, culminating in a discussion of discourses, narratives, political interests and actor-networks (while not neglecting their positivistic counterparts). These comprise a general framework for the analysis, though need to be considered or complemented by other theories, including positivistic explanations of causality, which add to the interpretation of the case study. Essentially, as one identifies with more complexity, models become redundant and, in Peter John's (2012) judgment, explanation degenerates to description but not poor description, such as lists of committees, laws, and public decisions, but "good"

description, which provides an account of human action based on a contextual understanding of the links and transactions among decision makers. I make no apology for aspiring to such descriptions and it is a 'descriptive' focus that this thesis takes as its point of departure. Armed with the understanding that networks, politics and discourses (Keeley and Scoones 2004) are important, but bolstered by micro-processes involving both structure and agency, or rather in combination, structuration (Giddens 1984), the approach is to provide an interpretive gaze on South African policymaking.

The specific methods used for the research are then described, with semi-structured interviews providing the bulk of the data to be analysed, looking for connections between vested interests, the use of knowledge and the processes through which it is produced and legitimised. For this reason, the methodological stance insists that social construction is foundational to policy processes. Such social construction may be detailed through interrogating the subjective interpretations of the actors involved, and through engaging with the narratives and discourses that these, policy documents, and project proposals exhibit, whilst also acknowledging each of these within their formative context and the contests over meaning therein. It should of course be remembered that:

> neither policy nor the problems to which it is addressed are natural phenomena with an existence of their own, independent of the participants; rather, they are produced by activities of the participants (Colebatch 2009b, p.97).

CHAPTER 3: SOUTH AFRICA'S PEOPLE AND POLICYMAKING

> *Shaun this topic is ideal because the issues of politics and the ways policies are made are an extension of, or rather embedded within the biofuels policy; it's a useful case study…* (Former BTT member A, 2012).

The above quote comes from one of my later interviews. It was also one of my longest. Within the discussion, the respondent shared his experiences of policymaking in South Africa, reiterating many of the concerns included in the literature review of this chapter, whilst adding many nuances that are not. Without extending too much on the details of the interview (these will come later), the point was that while there are a numerous existing reviews of policymaking in South Africa, they generally take a normative approach. That is, they focus on what ought to happen rather than present what actually happens. Acknowledging and understanding both is important, of course, and although a pithy suggestion (although the introductory chapter suggests others do agree), the review below still suggests a rich literature.

The chapter is separated into two main parts. To take further the issues introduced above, the second major part of the chapter is a meta-analysis of policymaking processes in South Africa. From a reading of the literature, it became apparent that some important studies of policymaking are found in nuanced case studies of development policy, which highlight some themes in common with those I wish to illuminate through the biofuels case study. As such, I provide a review of some of the existing policy studies in South Africa, focussing particularly on the various development policies and their critiques.

The first part of the chapter provides an overview of the 'governance apparatus' (borrowing from Van Der Walt 2013) or 'technologies of government', describing the dominant institutional arrangements, administration and their counterpart organisational capacities, as well as the political hierarchy and dominance of the

African National Congress (ANC).[1] These two broad themes reflect the administrative and political domains, which Eakin and Lemos (2006) regard as fundamental to understanding the state's ability to govern. They term this the 'state capacity', which comprises a political/policy capacity (the ability to make informed decisions) and an administrative capacity (that implements those decisions). However, it should be remembered that, despite such simple caricatures, "[i]t is easier to allude to 'the government' than it is to identify it on the ground" (Colebatch 2000, p.4).[2] To begin with, a brief discussion of the demographics and developmental challenges in the country leads to an outline of the governmental machinery through which the state responds.

GOVERNMENT AND THE GOVERNED IN SOUTH AFRICA

South Africa, as a middle-income country, faces significant challenges, in which a government of limited capacity confronts a range of social ills and 'wicked problems'. According to the 2011 census, South Africa has a population of over 51million people, increasing from approximately 42million in 1990 (Lehola 2012, p.18). Within the census, this aggregate is broken down into five racial categories—Black, Coloured, Indian and Asian, White, and Other. Blacks account for the majority at 79.2%. whilst Coloureds and Whites each constitute 8.9% of the population respectively (*ibid.*,p. 21). The multi-racial make-up of the country is matched by an equally diverse multiculturalism; one need only to look at South Africa's eleven official languages and diverse linguistic heritage for evidence of this (Mesthrie 2002). Following a peaceful transition to democracy in 1994, South Africa prides itself as being a 'rainbow nation'.

No study of policymaking and development in South Africa can ignore, however, the brutal history of dispossession through minority rule and the lasting legacy of

[1] As Rose and Miller (1992, p.193) suggest: "[g]overnment is a domain of strategies, techniques and procedures through which different forces seek to render programmes operable, and by means of which a multitude of connections are established between the aspirations of authorities and the activities of individuals and groups. These heterogeneous mechanisms we term technologies of government."

[2] Richard Calland, whose work I will expand on later, alludes to similar sentiments. Essentially, while it is easy to outline the government and the way it functions in theory; in practice, things are very different.

apartheid and colonialism beforehand.[3] It is important to recognise that the transition from a totalitarian and securitised state to democracy has been both a process but also a defining moment of translation; the primary lens through which we can define the current state of affairs (of which policymaking is a part). Fantu Cheru describes it aptly: "apartheid has been both an economic disaster and human tragedy" (1992, p.17). Beyond the brutality and its legacy, there are important institutional and socio-political features of apartheid that remain prominent even post apartheid. For example, Marquard and Eberhard (2000, p.4) understand apartheid as:

> a form of modernisation, an ideological response to urbanisation and industrialisation in a post-colonial society dominated by a settler elite. As such, it featured many of the ''social technologies'' that characterised the totalitarian state coupled with an affinity with science and technology and social engineering.

This modernisation ideology had important implications both for the content of and process through which policies were developed; technology was tantamount and deliberations secretive. As I will describe later, the transition to democracy was revolutionary to both these aspects, but in many respects, the country remains constrained by apartheid's divisive legacy, especially in the petrochemical industry (see Appendix E).

Apartheid and its Consequences in Brief

The overarching feature of apartheid was institutionalised segregation, which built on earlier racist, colonial laws, such as the Glen Grey Act of 1894 decreed within the Cape Colony. After (English and Afrikaans) South Africa unified in 1910, the historian Leonard Thomson outlines two major periods of exclusion that followed—a Segregation Era, (1910-48) and an Apartheid Era (1948-1978). During the Segregation era, laws such as The Native Land Act (1913) severely constrained black peoples' access to and ownership of land, dividing the country into 'white-owned' and 'black-owned', although with many more restrictions steeped on the latter. It was this Act that led Sol Plaaitje (2006, p.12) to proclaim: "[a]waking on Friday morning,

[3] The importance in acknowledging such a past is more than idealistic or sentimental but a pragmatic necessity. In the words of Johnson (2010), "[i]f you accept the colonial legacy and build on it, you can go beyond it. If you attempt to destroy or reverse it, you end with a failed state. History is unforgiving to those who wish to 'eradicate' it."

June 20, 1913, the South African Native found himself, not actually a slave, but a pariah in the land of his birth".

The onset of apartheid in 1948—when the Afrikaans National Party (NP) came into power—was not only one of deepening segregation through 'separate development' but better understood as explicit marginalisation. This policy resulted in the formation of Homelands, (also called independent African states or Banthustans) but was also one of fulfilling Afrikaner ethnic objectives by forming a republic and "Afrikanerizing" the state (see discussion of Thompson 2001, p.188). Strict segregation would thus permeate all spheres of life, from the day-to-day constraints of petty apartheid to the derisive separate development ideology of grand apartheid.

Within the exclusionary and segregationist apartheid laws, lay the origins of South Africa's current polarised and highly unequal society (Marais 2011; Viljoen & Sekhampu 2013). Whites enjoy far greater access to services and wellbeing than non-whites do. The far-reaching effects of racial segregation have left a majority of the population without access to basic services, a pervasive challenge to the post-democratic ANC-led government (Edigheji 2010b). A significant disparity remains post-democracy in which non-whites are "trapped in chronic, structural poverty, lacking the assets and entitlements needed to successfully escape poverty over time" (Carter & May 1999, p.2). For example, South Africa's Gini Coefficient, which is a simple measure of income inequality,[4] worsened by increasing from 0.565 to 0.577 between 1995 and 2000 according to one comparison and 0.68 to 0.73 between 1996 and 2001 in another (Hoogeveen and Ozler, 2006; Leibbrandt *et al*., 2006 cited in Bhorat & Kanbur 2006). (In 2009 the Gini Coefficient hovered at 0.66 according to the Presidency (2009a).) In 2003, the United Nations development programme reported that South Africa was the third most unequal country in the world (United Nations Development Programme 2003). These figures remain comparable to some of the most unequal societies globally, such as Brazil and Nigeria (Bond 2010), but also differ significantly between racial groups; they are much worse amongst blacks (Landman 2003). Bhorat and Kanbur (2006, p.13) summarise the situation in which

[4] The Gini coefficient can vary between "0" and "1". The closer to one (1), the more unequal a society, and the closer to zero (0) the more equal a society.

"the growth-poverty-inequality nexus retains a particular relevance for the future"; the first decade of democracy saw rising unemployment, rising poverty, and rising income inequality.

There has been some successful redress in response (see below) but significant challenges remain. The most pressing for this thesis is that the government's response appears beset by contradictions and gaps between policy and implementation. Successes are contrasted, as they are in a recent Economist briefing, by a 'failure of leadership' (The Economist, 2012; see also Gumede, 2012; Marais, 2011; National Planning Commission, 2011a; Taljaard, 2010; Thompson, 2007). Citizen frustrations of failing implementation has manifest in a variety of increasingly violent service delivery protests, though also reflecting a gamut of challenges from maladministration, nepotism, fraud, corruption to the failure of councillors and administrators to listen to residents (Carrim 2010). The failure in leadership thus can be expanded to include a slow but increasingly dire management crisis within the government bureaucracy. Once considered to possess superior managerial capacity than governments in the rest of the region, allowing it to put in place sensible policies (Cheru 1992), government departments in South Africa now face an increasing skills shortage and are berated constantly within the media, by politicians, within government reports (e.g. National Planning Commission 2011a) and by academics (e.g. Kraak 2011). To provide some context to all this, it is worth identifying what 'the government' means before considering how it appears to be 'failing'.

The Institutional and Administrative Structures of Government

The Republic of South Africa is a constitutional democracy with a three-tier system of government and an independent judiciary. Chapter 3 of the Constitution identifies the three spheres of government as national, provincial and local, with the 'local level' further classed as either district, local and metropolitan municipalities (Rep. South Africa 1996; Figure 3). Cutting across each of the 'vertical' spheres there are three 'horizontal' realms, comprising a legislature, executive and administration, with designated (but often blurred) roles and responsibilities.

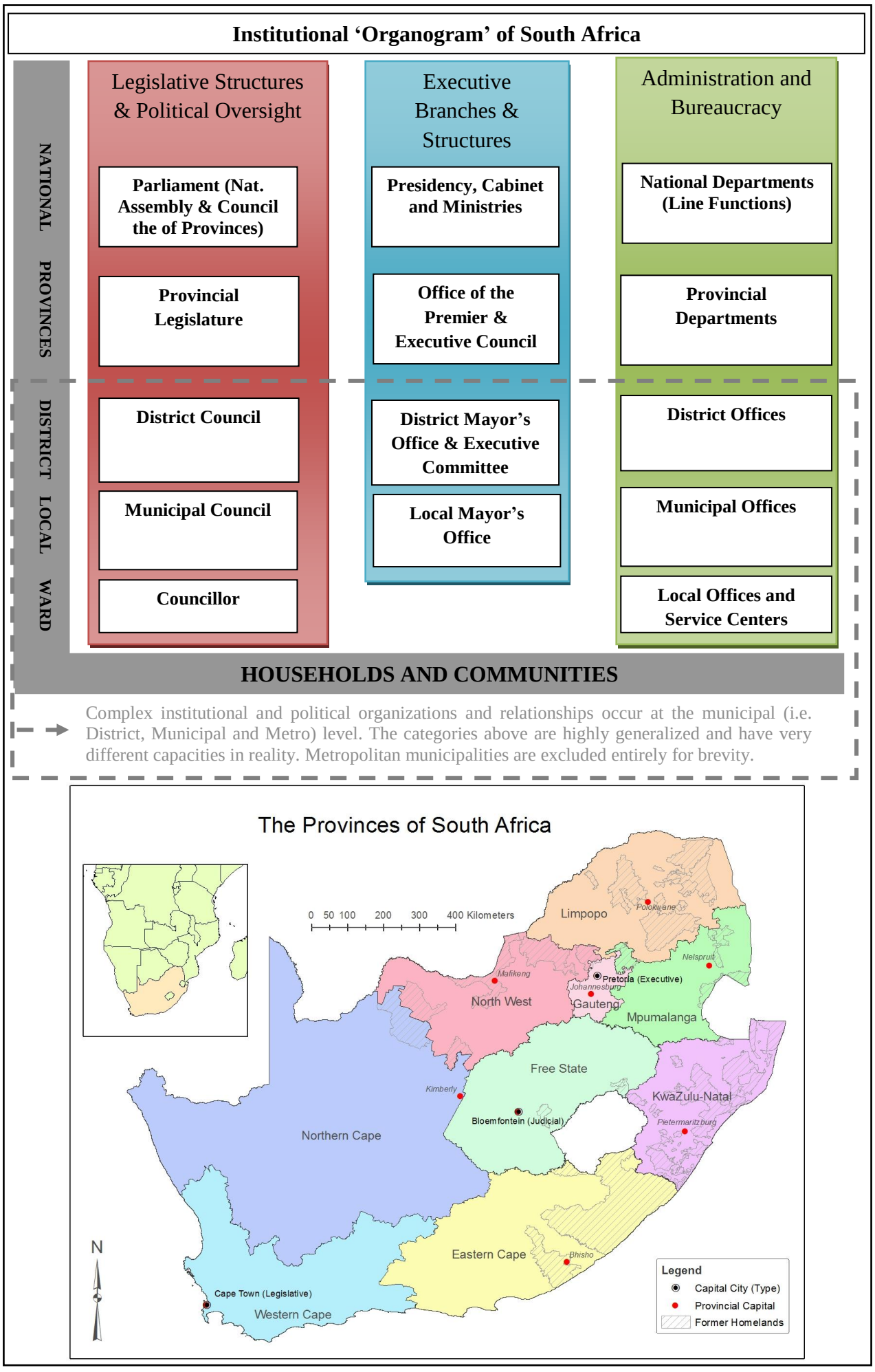


Figure 1: Institutional scaffold and map of South Africa

Despite increasing legislation and guidelines to ensure integration, intergovernmental relations have been challenging in practice. While each level has different overall mandates and are obliged to co-operate, Chapter 3 41(1)g of the Constitution expresses that:

> all spheres of government and intergovernmental relations should exercise their powers and perform their functions in a manner that does not encroach on the geographical, functional or institutional integrity of government in another sphere (Rep. South Africa 1996, p.25).

In an attempt to integrate government planning, President Mbeki introduced a 'cluster' arrangement in 1999. It brings together ministries and departments into related clusters. In South Africa, however, the general theme of 'joined-up government' must also be seen in an overriding financial context in which government departments have to adhere to fiscal arrangements of the National Treasury. These arrangements negate a blurring of funds to be used in joint projects. Richard Calland (2006, p.54) quotes an insight of Kader Asmal of specific relevance here: "as an attempt to strengthen 'joined up government', unless budget is allocated to the clusters - which it isn't - then it can't be 'joined up decision-making'."

The most popular interpretation of the three-tier system is that policymaking is the proviso of national government, while provinces and local governments are the implementers (e.g. National Planning Commission 2011b). In practice, the relationship is far more complicated, contested and protracted. Street-level bureaucrats do display some autonomy in decision-making, as long as those decisions conform to some extent with the overall policy thrust of national government. I have argued elsewhere that existing programmes within the provinces are, in cases, simply reframed in the language of the new overriding policy, while the activities remain the same (Ruysenaar 2012). Similarly, as my discussion on the provincial biofuels policy below outlines (Chapter 4), the national policy was actually pre-empted by provincial policies, which were later abandoned when, as a policy entrepreneur in the Eastern Cape suggested, "national took over" (ECDALA official B, 2011). Additionally, complex—if not byzantine—institutional arrangements configure roles and responsibilities in very different ways between line functions. Thereby, while policies derived in the Department of Education, for

example, might pass through their hierarchy relatively smoothly,[5] provincial Departments of Agriculture are actually autonomous and as such decisions and policies derived within the national Department confronts major institutional disjuncture when passing through the hierarchy (Ministry for Agriculture and Land Affairs 2005; Drimie & Ruysenaar 2010). Line functions also need not have respective provincial or local departments at all. The Department of Minerals and Energy (DME) is considered a national competency, comprising a solitary national administrative department. It is for this reason, amongst others, that there was a 'road show' during the development of the biofuels strategy. It was during this road show that the DME found that some provinces (or rather provincial Departments of Agriculture or Economic Affairs, etc.) had already taken their own initiative around biofuels. In the Eastern Cape, because the Department of Agriculture was initiating the policy, neither party had much idea of what the other was doing (see Chapter 4).

While much of the focus of this thesis is on the process of policymaking, and therefore focussed more at the national and executive levels and processes, it is useful to provide some overview of the difficulties encountered in implementation (especially as the two are not necessarily easily differentiated). When identifying the challenges to implementation, I am explicitly broad (that is, not focussed on specific project level attributes) and do not consider the wildly different contexts in which government implementation takes place.[6] Of particular interest, as it is within wider policy debates, is the general administrative issues experienced within the government bureaucracy. Two significant features, amongst others,[7] constrain the government's administrative capacity—politicisation and skills deficits.

First, it is necessary to provide some context. Whereas Weberian principles suggest that meritocracy and neutral competence are essential to the efficacy of any bureaucracy, the South African government has had to balance such demands with

[5] Although the recent textbook crisis suggests that even the more regimented hierarchical line-function of Education is not immune to operational challenges, although this is probably less of an institutional issue than a leadership one (MacFarlane 2012).

[6] It is acknowledged that such limited considerations such as these are partly to blame when projects and programmes fail; however, such an argument is not the focus here.

[7] Taljaard (2010), for example, considers continual restructuring (now moving towards a 'single', centralized public service) and corruption as two other significant issues.

building up nascent capacity and fulfilling ideological imperatives of Black Economic Empowerment (BEE),[8] whilst transforming[9] the public service. Ivor Chipkin (2008) suggests, for example, that in South Africa transformation in the public sector is about two things—improving the efficiency and efficacy of the state and, although perhaps contradictory, achieving demographic representation in the public service.

In this latter pursuit, the government has succeeded. By 2004, the composition of the public service broadly reflected the country's demographics and nearly 75 per cent of all public servants were black. It is also argued, that in terms of ensuring services are delivered equally to all, it was vital for the bureaucracy to be representative of the country's demographics and instil the requisite political ideology (see Cameron, 2010). The pace of transformation varies according to level of government and along expertise and gender lines. For example, in 1994, the proportion of black managers in the civil service sector was at six per cent; in 1997, this rate had risen to thirty-eight per cent at national level and sixty-six per cent in the provincial administrations (The Economist 1999). In 1995, only 7.9 per cent of public service managers were female, but this figure tripled by 2004 (Naidoo 2004) and 34 per cent of senior management positions were held by women by 2010 (DPSA 2010). With transformation positively progressing, the question is whether there were matching skills to follow through on the plans of government. The same could be asked of technical decisions around biofuels. As was highlighted by a BTT member, there was limited technical knowledge or skills within the Task Team when the strategy was initiated (BTT member A, 2010). There were also only a few individuals handling

[8] The origins of BEE took the form of affirmative action, in which the ANC wanted to ensure that Blacks were given preference over White counterparts, given the exclusion suffered during apartheid. The Reconstruction and Development Programme (RDP) provided the impetus for affirmative action shortly after the 1994 elections, whilst BEE was formalized through various codes of practice promulgated in 2007.

[9] When talking about transformation, one should distinguish between 'transformation' (a completely new paradigm shift) to 'change' (response to pressures and forces). Constitutional reform has lead to transformation and change in almost all spheres of government in SA (Roux 2002). Taljaard (2010) distinguishes three major shifts in public sector focus including the 'rationalisation and policy development phases (1994-1999)'—building the ideas of reconciliation and rainbow nation, whilst rationalising the service culminating in the White Paper on the Transformation of the Public Service; the 'policy development phase' (1999-2004)—focussed on modernisation and implementation with NPM principles of improving managerialism and 'allowing managers to manage' and finally a 'modernisation and implementation phase (2004 to the present).

the policy's development within the DME itself, who were inexperienced in the face of this new and complex technology (former BTT member B, DME, 2010) and overstretched by the engagement.

It is understood that a well-functioning administration is foundational to a developmental state (von Holdt 2010). To improve efficacy, the operations of the South African public service were changed significantly when Thabo Mbeki came to power, in the second term of the ANC as ruling party. To improve coordination in both decision-making and implementation, President Mbeki not only institutionalised the cluster system (see above) but also emphasised that the government bureaucracy should replicate the private sector.[10] With impetus from the austerity and neoliberal plans of GEAR (and earlier debates over public administration), he reiterated bureaucratic principles in line with New Public Management[11], having a penchant for technocratic governance. That is, there was recognition that an effective administration needed highly skilled officials to ensure efficacy and efficiency.

It is important to highlight that it is not only the government bureaucracy facing a significant skills shortage. As a Joint Initiative on Priority Skills Acquisition (JIPSA) report describes (2007, p.6):

> South Africa lacks sufficiently skilled professionals, managers and artisans, and the challenge is amplified by the uneven quality of education and the impact of the apartheid legacy, which located many people a great distance from their places of work, thus pushing up the price of labour of the poor.

In their 2010 report, which summarises four years of experience, South Africa's skills challenge remains as critical as it was at the time of JIPSA's formation in March 2006 (2010, p.3). Considering that the JIPSA was a multi-stakeholder

[10] Apart from ensuring adequate skills, the central doctrine here is that the public sector should encourage competitiveness in the same way market principles do (Castilla 2008).

[11] Academics (see Manning 2001) consider this term a slippery one, presenting a menu rather than a discrete or coherent set of ideas *per se*. It is used here, as it remains a useful label within the South African to distinguish between the highly politicized public service during apartheid and the supposed move towards a more meritocratic and representative bureaucracy based on market principles. Of course, it should be conceded that, like many other developing country contexts, the application of NPM principles was probably more rhetorical than operational and indeed there was "never a deliberate strategy to adopt the NPM as an embodiment of a benchmark for public sector reform to be pursued uncritically" (Fraser-Moloketi 2006, p.15). O'Flynn (2007, p.354) highlights seven foundational principles of NPM: hands-on professional management; explicit standards and measures of performance; greater emphasis on output controls; disaggregation of units in the public sector; greater competition in the public sector; private sector styles of management practice; and greater discipline and parsimony in resource use.

working group to rectify an inadequate grasp of exactly what skills South Africa requires and fast-track the provision of priority skills (Burtenshaw 2006), its lessons are important ones but clearly significant challenges continue and capacity remains topical.

It is impossible to go into any deep discussion of the skills shortage here (Bernstein 2007 provides a useful overview). One could consider, for example, skills deficits in terms of qualified or experienced individuals not being available at all or positioned unsuitably when they are. One could also split capacity into types, in which there are experts available but administrative and managerial capacity are lacking (Calland 2006). One could also point to unclear processes and systems (Mokgoro 2000), and because of this, poor filing systems, a dramatic flux of personnel and very little institutional memory. The clearest demarcation of inadequate human capacity in government, however, is the high vacancy rate within various departments. Averages hover between 20-30 per cent vacancies in government departments, while technical skills within local government are sometimes non-existent (Taljaard 2010; Bernstein 2007).

As much as the ANC instilled principles of a 'modernised' and capable civil service within public sector reforms post apartheid, the transformation was inherently a political project and in many ways actually eschewed New-Public-Management (NPM) principles.[12] The logic of technocratic aspirations seems antithetical to the poorly capacitated South African public service, which is further undermined by a powerful and important *nationalist* project predicated on a set of informal rationales shaped by the imperative to undo racism and white domination (von Holdt 2010). For this reason, there is increasing reliance on experts and consultants from outside of government, though the case for evidence-based policy is a tenuous one. Whilst

[12] One has to acknowledge that a clear separation between the political sphere and administrative one would be naïve, but what is important is that the processes of modernization were politicized too. For the most part, bureaucracies remained hierarchical (Cf. von Holdt, 2010) in much the way Weber would have intended whilst 'customer first' and accountability, two hallmarks of the NPM movement, appear to have made limited appearance in the South African Public Service. Despite an intellectualism and preference for NPM in the Mbeki era, there is and has become increasingly an anti-intellectualism in the hierarchy of the ANC, which opens up the possibility that politicians are not involved in the early policy and fact-finding processes and may even be largely resistant to knowledge and evidence once it is produced.

South Africa does possess the expertise to create 'evidence' outside (and some cases within) the government apparatus, the use of such evidence, as proposed within NPM discourse, relies on Weberian bureaucracies presumably such as those within the UK (Cf. Sanderson, 2002), not the highly politicised agencies of South Africa (Du Toit, 2012).

Ultimately, there was and remains an increasing tension between or convergence of partisan control of the government bureaucracy, in which civil servants' activities depend more on political criteria than professional merit-based norms defined by administrations and ruled by law (Cameron 2010).[13] A full discussion of this issue is also out of place here, but is important in so much as it suggests that where sufficient capacity exists within the public service, it is susceptible to political aspirations over and above neutral compliance and implementation of policy, as is enshrined in the Constitution. It is also quasi-technocratic in that, although the government has broadly embraced 'NPM' ideals during the Mbeki era and its macroeconomic policies generally reflect the decisions of technocratic elites somewhat insulated from wider political involvement, policymaking is influenced by political intervention, especially, for example, via cadre deployment within government (Giliomee *et al*. 2001).[14] All of this needs to be seen in the context of unrealistic aspirations of NPM and an overarching technocratic policymaking, or evidence-based policy discourse, which I will return to later.

POLICYMAKING PROCESSES IN SOUTH AFRICA

The above discussion outlines the broad structural features of the government and a sense of the formal dimensions of governance in South Africa. Although the

[13] Rouban (2003, p. 200, cited in Cameron 2010) suggests politicisation is manifest in three ways: civil servant participation in political decision-making or in the definition and implementation of public policy; politicization in political control over the nomination and careers of civil servants; and politicization in the form of political involvement by civil servants as citizens and voters.

[14] This is a highly complicated issue and the description here is necessarily pithy. There is of course much evidence that policymaking in South Africa is indeed technocratic in the sense that it is often handled by external expertise, upon which implementation fails. This is one of the central themes in Chapter 6. It should also be recognised, as I have been informed that often strategy development is handled by external personnel as a means to mediate any conflicts of interest and minimise political and/or management rebuke should restructuring or drastic changes be called for.

"institutional geometry is spectacular" (Calland 2006, p.8)[15] the real issue is how government actually makes decisions. Part of the answer can be found in existing reviews of government performance. Some of these illustrate the importance of the above discussion of government administrative practices. For example, the National Planning Commission and National Development Plan (NDP) presents the latest and most comprehensive interrogation of government functions, so it is worth dwelling on some of the issues raised within the diagnostic report (National Planning Commission 2011a, p.22), which informed the final plan. They conclude for example,

> there is often a significant gap between the aspirations set out in official policy and what happens on the ground. The uneven performance of the public service results from the interplay between a complex set of factors, including tensions in the political/administrative interface (see above), instability of the administrative leadership, skills deficits, the erosion of accountability and authority structures, poor organisational design, inappropriate staffing and low staff morale".

There is appreciation also in a section entitled 'policy instability' that:

> [p]olicy cannot be cast in stone; existing policies do need to be reviewed on the basis of a considered assessment of performance, and modified or even overhauled when necessary. But too often new policies have been implemented in an unconsidered fashion, as new leaders seek to make their mark, or as a response to the latest international fad.

The NPC report is one of an array of reviews and investigations, some independent but many organised by government. Whereas the majority of these are supposed to inform policy, and many probably do, very few actually interrogate the policymaking process, or turn a reflexive gaze on how such reviews actually replicate many of the challenges they seek to reform. Very few interrogate the importance of politics and critically assess processes of policymaking. As a report prepared largely by academics, the NPC diagnostic report takes such issues much further than those beforehand. Before continuing on the NPC and critical studies of policymaking in South Africa, in the next section I will begin a brief review of some 'linear' models of the policy process and then move on to more critical outlines thereafter.

[15] Calland (2006) recognizes here what Butler refers to in terms of "redrawing diagrams is the easy part" in which restructuring is seeing as simply retrofitting 'organograms' (structural diagrams of organisations) but ignoring how they actually operate (Butler 2009b; e.g. Drimie & Ruysenaar 2010).

Models of Policymaking in South Africa

There are some generic frameworks of how policymaking is considered in the rational, linear sense, as well as some specific academic analyses of policymaking in South Africa. As the outline of the linear model of the policy process suggests, one can isolate the general progression through which policies are made.[16] In South Africa, this may broadly include four stages involving political objectives or initial 'vision' passing through various policy frameworks, consultation and political oversight through cabinet and parliament (Table 1). Other frameworks, as would be expected from the discussion of chapter two, add greater complexity to the linear conceptualisation. Khosa (2003, p.8) for example, presents three different models of the policy process (Table 1) in which:

> [t]he general model assumes that policy-making follows particular steps, and the role of various stakeholders can substantially shape policy outcomes. The Executive, at the ministerial and presidential level, largely drives the executive consultative policy-making model. The panic model is mainly driven at the cabinet and presidential level, and this is largely shaped by the imperatives of global events and local crises.

Khosa's (2003) review takes us closer to the political influences in policymaking, although only provides a rough overview. Clearly, the politico-administrative interface is important and in some cases, the political is the dominant feature. In the next section, I will therefore outline the importance of the ANC and extend into nuanced reviews of policymaking around development in South Africa.

[16] It should be noted that there is a difference between a policy and a law. Although I consider policy to be more general, some scholars (Roux 2002, p.421) argue "that a policy becomes significant for the purpose of public administration only after legislation has been passed". There may be some truth to this as legislation carries with it higher responsibility, however, coercive legislation does not necessarily compel different levels of government to cooperate (Drimie and Ruysenaar, 2010).

Table 1: Policymaking models in South Africa

Model	Education and Training Unit (2007): Generic Stages of Policymaking or 'Stagist' Models in South Africa.	Khosa (2003): Three models for policy-making. Policy models differ in terms of the origination, timing, context, and content of the policies being made.
Description of policy process/model	Stage 1: Ruling party conference provides vision, goals and direction This stage could be likened to 'agenda setting' in the 'stagist' model and takes place at the major conferences of the ruling party where policies are negotiated	**General Model:** Replicates the linear model described adjacent. Policy tools include Discussion Documents, Green Paper, White Paper, Legislation and Acts. Each of these involves different degrees of consultation and is written by different actors. The RDP is an example here.
	Stage 2: Executive (Ministry) draws up policy on an issue National level departments or Ministers (the executive) convert party policy into government policy or law. After consultation with interested and affected parties (opposition parties, the public, non-government organisations, etc.), it is sent to Parliament for debate and approval	**Executive-Consultative Model**: Largely driven by the executive at the ministerial and/or presidential level, involving stakeholders invited into a task team to draw up a policy document. There after a Commission Framework may be produced, which may be publicised but may not be consultative (although public outcry may lead to a revised Policy Framework with an Adopted Policy Framework accepted by the Cabinet, President or Parliament. The Industrial Biofuels Strategy will be argued to conform closely (but not perfectly) to this model.
	Stage 3: Finalising a policy Once a policy has been properly debated, the Department and Ministry finalise and publish it as White Paper, also requiring approval of Cabinet and Parliament. (A White Paper may also be preceded by a discussion document or Green Paper, which is less detailed and may focus more on 'what?' and 'why?' rather than 'how?'.) As an official statement of intent, the White Paper may form the basis of a law with which to achieve certain stipulated objectives.	**Panic Model**: Follows the same pattern as the Executive Consultative model in which a Discussion Document by the executive and a task team, but forgoes any changes in response to public outcry or further consultation after the initial Policy Framework Strategy is developed. They are usually finalised by Presidential or Ministerial Decree. GEAR is an example here.
	Stage 4: Passing Legislation A draft Bill is developed. After undergoing similar processes as Stages 2 and 3, it is sent to Cabinet to ensure coherence with other policies and legal advisors for legal approval. It is then tabled in Parliament as a Bill.	

Policymaking and the Domination of the African National Congress

If the institutional arrangements of the South African government are based on devolved or decentralised governance, the African National Congress, the governing political party, works in very different ways. Owing to its heritage as a resistance movement, there are strict hierarchies and the institution of the ANC has become increasingly centrist, especially during Mbeki's administration (Gumede 2007). The situation is that by its overwhelming majority, the ANC, its ideology, operations and own internal dynamics are increasingly the thread through which the fabric of governance in South Africa is weaved. Central to this thesis, however, is the means through which the ANC conceives and articulates policy, as well as the way in which ANC structures influence those of the state's policymaking procedures.[17] It should also be mentioned that the ANC might not differ in some processes compared to the prior regime. Cloete (2005) suggests, for example, that in the post-1947 era in South Africa, up to the present, public policies have become acceptable mainly for party political or ideological reasons rather than for their technological, rational or practical feasibility, and that when policy changes did occur they were primarily 'top-down' decisions with a dearth of input from lower-level policy role-players.

In his book '*The Anatomy of South Africa*', Richard Calland (2006) devotes significant attention to who holds the power. He answers this question by considering power through the two dimensions of *importance* and *influence*. That is, importance derived through some designated authority and influence being the ability to trump such authority through process. The two are not necessarily mutually exclusive, something or someone that is important can but need not be influential and *vice versa*. The importance of Calland's work, as others (Bond 2005; Gumede 2007) too have recognised, is to decipher exactly what power the ANC holds, but the answer (or in fact the question) is not a simple one. As an organisation, the ANC falls within the category of having significant influence as well as being important —it is an "ever-present shadow"—but it is bettered in these categories by the Cabinet, the

[17] This should not be considered a negative value-judgment or criticism. As the ruling political party, it is of course the ANC's prerogative to shape policies in South Africa; the important point is how exactly this is achieved.

National Treasury (a so-called government within government) and the Presidency. The centrality of the Presidency cannot be ignored; "the surest way to influence policy from outside government is through direct access to the president's office" (Dorman 2012, p.169). However, that the president is also part of the ANC suggests, as Calland details, that the power of the ANC as an organisation is not easily circumscribed.

Whereas it is difficult to delineate the extent to which the ANC influences government, both being subject to continual flux, there are a few points Calland (2006) makes are worth highlighting in their own right:

- Although advisors can have a lot of influence (on policies), Cabinet Ministers have political power over decisions that are made.
- Cabinet is informed of policy matters through cabinet memoranda (or 'memos'). They are produced through a technical process of review and by "the time the policy idea reaches the cabinet table, it should be in a finely tuned condition" but with the possibility of "tough political decisions" still pending (2006, p.48).
- The political judgment is the culmination of a "non-technical process that usually runs parallel to the technical side of the policymaking". It could be broadly defined as the consultative side of policymaking.
- Depending on the nature or content of the policy, a more elaborate policy-making process may unfold; each may involve "slight variations according to its political needs" (Calland 2006, p.48; see below).
- The golden rule for lobbyists is get in early … changing a government's mind is more difficult than influencing the original decision.
- A lot of the time government tends to operate with insufficient consultation during the policymaking process. Ideas are kept within the executive, perhaps as a result of the complex governmental decision-making apparatus now assembled.

Notwithstanding all the above, the political decision will be informed to some degree or other by wider ideological and strategic considerations funnelled into the cabinet process through three channels—the presidency's own policy units (which also

prepare the Cabinet memos), the Department of Finance (Treasury), and lastly through the ANC (especially through the influence of Joel Netshitenzhe during Mbeki's leadership). In theory (and instrumental to a development state), ministers of the Cabinet are collectively answerable to the legislature. In practice, this line of accountability is weak (Edigheji 2010b; Calland 2006). If anything, the increasing strength of political parties has dramatically increased accountability to the party rather than to the electorate. As Butler (2009a) notes "the past 100 years have seen a mostly irreversible growth in the power of the executive branch around the world" (cited by National Planning Commission 2011b, p.14). South Africa is no exception and the overwhelming majority of the ANC permeates the functioning of this democratic institution too (*ibid*). So too does the crippling effect of incapacity, which is also often inadequate for scrutinising complex legislation. For example, at times the Parliamentary Portfolio Committee on Minerals and Energy has only had access to one researcher (National Planning Commission 2011b citing EGISA 2010, p.23).

Others are more optimistic. Pothier (2012, p.3) suggests:

> [w]e are fortunate to have one of the world's most open parliaments. Since 1994, a culture has developed that encourages public involvement in the crafting of laws, and CSOs [civil society organisations] have been diligent in responding to this openness. Hardly a law goes through the legislature without having been influenced to some degree by the comments and criticisms of civil society. Almost always, this leads to an improved piece of legislation, as the combined wisdom and experience of civil society is applied to the Bill in question.

Unfortunately, his paper also highlights that there is no resources for CSOs to carry out their activities.

Wider Influences on Policy: Enter the Developmental State and Development Planning

Although the constitution provides an impressive and binding institutional scaffold, policymaking (and government practice) is convoluted and subject to multiple influencing factors, especially political domination pivoted around the ANC and the executive. Politics clearly plays a significant role and, while lack of accountability

limits the checks and balances in the system, other factors need to be considered too.[2] Whereas there are internal factors influencing policy, there are external influences too.

In this section, I will provide some examples using 'development' policy in South Africa as the frame of reference.[3] The purpose here is two-fold. First, the shifting terrain of the Reconstruction and Development Programme (RDP) to Growth Employment and Redistribution (GEAR) after 1996, illustrates some of the complexity of policymaking in a more tangible way, whilst also providing some idea of external influences. Second, it provides a backdrop to the 'rhetorical' rise of the developmental state in South Africa and the Accelerated and Shared Growth Initiative of South Africa (ASGISA), which was the overriding macro-economic framework when the Biofuels Strategy was being considered. When read together, these two ideas are important as they highlight what the political ideology and macro-frameworks have meant for policy and ostensibly for development too.

Gearing up for Reconstruction

> South Africa's policy thrust reflects global policy trajectories and is committed to a national social transformation project within a decidedly neoliberal ideology (Lewis & Naidoo 2007, p.134).

Prior to the 1994 elections, development policy was largely reflected in macro-economic or individual, sectoral initiatives. As Crush (1995, p.vii) suggests, the language and practice of development in South Africa prior to democratisation was "tainted by their association with segregation and apartheid". After the release of Nelson Mandela in 1990, and during the transition to democracy in 1994, a barrage of international development expertise working within the 'discourse of

[2] It should be noted that there are other systemic challenges in which, for example, secrecy, impropriety and the failure of accountability coil around each other in a 'triple helix of misgovernance' (Mail and Guardian Editorial 2013).

[3] Gumede (2009, p. 19) identifies four such inter-linked planning phases the last of which being when the biofuels policy was developed:
1994 – 1996: the Reconstruction and Development Programme (RDP);
1996 – 2000: the Growth, Employment and Redistribution Strategy (GEAR);
2000 – 2004: the rise of micro-economic reform and an expansionary state; and
2005 – 2008: ASGISA, accelerating infrastructure development.

development'[4] began to shift the initial and overtly Marxist-leaning policies of the incoming ANC.[5] It should be emphasised though, that it was not only external interests at play; local policy entrepreneurs were instrumental in negotiations too (e.g. Tomlinson 2002). 'Growth through distribution' emerged as a pragmatic and acceptable approach, consolidating the redistributive preferences of the ANC, the growth fundamentals of the international development apparatus and protecting the interests of the incumbent National Party and 'white capital'.

The Reconstruction and Development Programme (RDP) articulated the logic and plan of action for of this growth and redistribution (Government of National Unity 1994). Although leading to some initial and remarkable redress,[6] the Growth Employment and Redistribution (GEAR) programme replaced it, bearing a stricter focus on fiscal discipline.[7] The spirit of the RDP, however, has remained prominent in policy thinking and rhetoric from the ANC. It is, for example, made explicit in the RDP that 'the people' should be consulted and "become part of the decision-making process" (Government of National Unity 1994, p.8),[8] which remains an important *modus operandi* in policymaking processes (see Box 2 further below). Patrick Bond,

[4] By a 'discourse of development', Crush (1995) is suggesting that it is not simply a case in which aspirations of the ANC were captured by or replaced with the logic of international capitalism associated with the West but a more complicated and subtle situation with development itself comprising of systems of language and logics, whilst also acknowledging power-laden local and international contexts.

[5] In this section, I follow the South African (leftist) literature that suggests the discourse of development is configured around capitalist conceptions of economic progress generally considered as neo-liberal (Cf. Castree, 2006) in contrast to Marxist or leftist priorities. It should be noted that there is perhaps room to critique such clear demarcations of 'development discourse' between such camps. As Dirlik (2012, p.2) argues, both Marxism and capitalism are contingent on a 'discourse of developmentalism' and that the Marxist/socialist alternatives remain unconvincing so long as they fail to break out of the ideological space defined by the developmentalism that Marxism shares with capitalism (citing also Dirlik 1995).

[6] Given the Constitution's provisions that all citizens are entitled to social security, the government put in place an extensive welfare system, catering for the aged, disabled, children in need, foster parents and many others too poor to meet their basic social requirements (Harsch, 2001; Visser, 2004).

[7] The transition from RDP to GEAR is not at all a clear one. Whereas the RDP office was closed in 1996 and budget for the programme moved to the Ministry of Finance, the rhetoric and individual remnants of the programme continued to use its name in operations. The 'programme' encountered a rhetorical revival in 1998/99 according to Bond (2005). Bond further suggests that there was no individual 'failure' of the RDP, rather its progressive elements were forgotten or contradicted by emerging government policy. Much of this has to do with its populist symbolism (whether or not people had benefitted from it, they thought they had regardless) and its abandonment as policy.

[8] Clive Corder (1997) suggests a tension in terms of popular accountability, between technical competence and popular ignorance, the time involved and who you are actually supposed to consult.

provides an ethnographic outline of how the RDP was developed and thus provides some important insights into policymaking as a practice rather than expressed ideal, although the importance of his findings for policy processes are more implicit than explicit (see also Hentz 2005).

In his book, '*Elite Transition'*, Patrick Bond (2005) provides a leftist critique of the retreat from progressive reforms towards neoliberal macroeconomic frameworks. In doing so, he traces the development of RDP and its subsequent transformation into GEAR. At the heart of this transition is policymaking at its most ambitious and at its highest political level too. It should be noted that his early involvement in the process provides him at once both important 'insider' information but also insists his work is read with some idea of his frustration and potential bias. As a prominent and outspoken leftist academic, somewhat marginalised during the deliberative process, his interpretations would obviously remain less than sanguine about the RDP. His exposition thus needs be read along with other scholars, for example, William Gumede (2007), Richard Tomlinson (2002) and Ben Turok (2008) who provide equally important accounts. Where necessary I add reference to such works within the discussion.

Bond (2005, p.10) begins a critique of the RDP, considering it as "an uneven and often internally contradictory document, to be sure" and providing some reasons as to why. Fundamental to this, as mentioned above, was the homogenising effect of 'development discourse' but Bond takes this further unpacking "Scenario Plundering" as one of the most important operational 'black-boxes' that, rather than providing a basis for deeper analysis,[9] were tools of negotiation and an "empirical basis for corporatist dealmaking in the sphere of macroeconomic policy" (*ibid*., p. 39). Bond then unpacks a range of scenario plans and amidst multiple shortcomings in many of them and, with some progressive stances and utterances entering the fray, he illustrates that the process was important in that it "was remarkably successful in

[9] Although a range of scenarios were prepared from different, if not competing, viewpoints, they were all analytically weakened by leaving out what Bond (2005) refers to as the Achilles heel of South Africa's economy: overproduction of luxury goods and capital-intensive technologies of multinational corporate producers. They also did not lead to significant 'action'.

drawing in political elites and taming some of their once-radical technical supporters, leaving dissidents outside the net" (2005, p.55).

Scenario planning was only part of the story. Bond also illustrates how key individuals involved in the policymaking process shifted the power balance in neoliberal directions. With Trevor Manual taking over the leadership of the ANC's Department of Economic Planning in 1990, and with Jay Naidoo and Alec Erwin[10] being at the apex of COSATU,[11] progressive voices were increasingly marginalised. Through these early processes and under shifting power structures in the ANC and incumbent government, "the ground for a massive basic-needs crop failure was sewn during the period 1990-93 (2005, p.40). Furthermore "[i]n short, it was critical for *status quo* forces to establish an artificial distinction between the progressive micro-social policies and what came to be known, ironically, as 'sound' macroeconomic policy, in part by building a myth: the feasibility of combining a social welfare state in the developmental sphere with neoliberalism in the economic sphere. The RDP embodies this conceptual feat" (2005, p.39).

It is, however, within these seemingly contradictory objectives that Bond suggests that "the policy framework was beset by enough fragmented voices, multiple identities and competing discourses to leave even postmodern analysts confounded" (2005, p.67), whilst leaving the RDP itself as being open to interpretation. Three main political interpretations (or supporters) included leftist (socialist), centre (corporatists) and right (neoliberal) perspectives. While elements of each are easily identified, what are important are the shifts in which reforms resonating with progressive ideals and social upliftment are increasingly abandoned; doublespeak within the policy was used not as operational imperatives but rather as a rhetorical toolkit for politicians and government officials. This he sums up by suggesting there

[10] Alec Erwin became Minister for Trade and Industry in 1996, moving to Public Enterprises in 2004. According to Calland (2006), he was instrumental to the big decisions from 1990 to 2004 but as an ex-unionist he was labelled (as was Jay Naidoo) "a convert to economic orthodoxy" (Hentz 2000, p.151) as deputy Finance Minister after 1994.

[11] COSATU is the Congress of South African Trade Unions, who with the Communist Party partnered with the ANC as part of a tripartite alliance after their unbanning in 1990. Together the three would work together towards the establishment of a democratic and non-racial South Africa, economic transformation and continued process of political and economic democratisation (COSATU 2009).

was limited recognition that all such talk might contribute to a vapid populist ideology.[12] Neither was it sufficiently understood that the RDP mandate would be rapidly replaced by sectoral deals and ministerial patronage networks, or that a "series of train-wrecks would pulverise progressive aspirations" (*ibid.*, p. 71). It is the first of these "train-wrecks" that provides a vivid illustration of policymaking within the hierarchy of the ANC and within the, then, Government of National Unity.

In "Train Wreck One", Bond presents an outline of what went wrong organisationally for the RDP, through the development of the RDP White Paper. Organisationally, the RDP office was neither in control of spending nor was its Minster, Hon. Jay Naidoo politically able to coerce counterpart Ministries—especially within a relatively conservative Cabinet—or even lower-level policymakers. With the odds stacked against the RDP, Bond first questions whether Minister Naidoo did enough to ensure the RDP was implemented and ensure a more progressive stance. Although Naidoo launched into developing a White Paper (the new government's first), he allocated the drafting of an initial RDP Green Paper to "two technocrats (Andre Roux and Ishmail Momomiat) closely associated with the ANC's Neo-liberal wing, which was based at the Development Bank of South Africa" (Bond 2005, pp.72–73). After some criticism from the left, there were minor attempts to redraft the strategy. Limited time, a new focus on "pleasing the markets" and final drafting by big capital (including Bobby Godsell of Anglo-American and Rudolf Gouws of Rand Merchant Bank), lead to a strategy approved by Cabinet but one prioritising a business-like approach and not tackling the more durable economic problems at the time. Inscribed in this process was, thus, a significant shift from the initial RDP document(s), with the White Paper amplifying the neoliberal agenda[13] (see also Adelzadeh & Padayachee 1994).

---

[12] "Any hope for hegemonising a progressive reading of the *RDP* was very quickly snuffed. ' Reconstruction and Development' soon became code words for patriotism, as society's traditional economic elite (egged on by the ANC's *comprador* class) won back the ability to demarcate the national project. The charade of exalting the *RDP* while doing precisely the opposite of what it instructed became increasingly popular within government too (Bond 2005, p.72)."

[13] Bond (2005, p.73) considers this agenda to be one in which 'the Reserve Bank would continue setting ridiculously high interest rates; fiscal discipline to become more extreme; currency controls to be lifted at the earliest opportunity; an already export-biased trade policy to grow more obsequious to global corporations and to bankrupt more uncompetitive firms—through tariff cuts—than required by even the General Agreement on Tariffs and Trade; and industrial policy to

The above discussion begins to highlight the importance of overriding discourses (whether planning or plundering) through which policy agendas are set, the importance of political ideology, powerful actor-networks (especially between politics and business) that are able to sway decisions, and that policymaking in these areas is dynamic and contested. What is interesting in all this is that, despite shifts towards a neoliberal economic policy (as dominant discourse) the White Paper also began to "develop 'a policy-making methodology and outline government implementation strategies within the framework provided by the Base Document' (the original RDP [see Box 2])". More importantly, the content and structure of the RDP White Paper (and indeed later macro-economic or development plans like ASGISA and the NDP) features an underlying meta-framework.[14] While not necessarily specifying actions to be taken, these meta-frameworks are normative proposals of what should be done or how further frameworks might take shape. They are thus frameworks for frameworks, directing the development of further plans, models, actions and activities, which are necessarily (hopefully) more concrete. This does not mean that that is how they are used. It also takes for granted the very real barriers to implementing (let alone planning for) many of their primary recommendations (as outlined above). It is such issues that I will reflect on when interrogating the Industrial Biofuels Strategy in later chapters. (Office of the Presidency 1994)

'pick the winners' and to de-industrialise those sectors (like clothing, textiles and autos) which would not stand the heat of international trade.

[14] I have borrowed such a term from computer programming language in which developers use the term to define "a specialized framework that allows easy integration of other functional specific frameworks that work together seamlessly" (Dutt 2003). I do so to show its operational function but there are alternative descriptions of the RDP specifically. According to Marais (Marais 2001, p.239), for example, the RDP was an ideological reference point that seems to confirm the political-historical continuity between the Freedom Charter and the realities of post-apartheid South Africa. The important point is not only looking at the content of such frameworks but how that content may be used.

Box 2: Policymaking Provisions within the RDP White Paper

"The Reconstruction and Development Programme (RDP) is the policy instrument which will direct the progress of the transformation strategy. It is a programme of policy development and implementation procedures co-ordinated in the Office of the President, and founded in the Government of National Unity. As the programme develops, it will integrate the different organs of government, centrally, regionally and locally in a concerted drive towards the national goals of renewal. Each province will, in time, prepare its own RDP in relation to the central RDP initiative…It is the product of on-going consultation, and has been adopted and supported by all political parties in the GNU and in parliament, and by all sections of our society. It is designed on the foundation of a national consensus and embodies the vision of the future." (Office of the Presidency, 1994, p.6)

The RDP also established a number of "Ministerial Forums between national Ministers responsible for Schedule 6 functions and their provincial counterparts … which will also be supported by their respective technical committees consisting of senior officials of the provincial and national line-function departments". The latter can also play a crucial role with regard to the RDP as their briefs include co-operation on, amongst others, policy and strategy formulation and implementation. A variety of sectoral negotiating forums has developed a participatory approach to policy formulation.

Furthermore, "structured consultation processes at all levels of government will be introduced to ensure participation in policy-making and planning, as well as project implementation. Task teams will have a key advisory role in policy-making methodology. This methodology will draw on project experience extensively, and hence will engage in extensive local-level consultation and participation … Expertise for this purpose is broadly defined to ensure proper representation of the interests of disadvantaged groups and communities. Similarly, the Government will formulate an integrated and sustainable rural development policy in consultation with rural people, their organisations and stakeholders.

The outline of the RDP White Paper therefore reads like many of its successors; there are bold plans calling on government action at all levels. These grand plans (though the diagnostic report of NDP may be an exception) do not account for any of the challenges faced at lower levels of government; even though such barriers continue to stifle the best-laid plans (see above).[15] It needs also to be recognised that capacity issues can also be a convenient excuse. We should neither ignore that those with capacity may abuse it (Butler 2008), nor that bureaucrats "can subsume deliberative exercises within conventional processes and return quickly to business as usual" (Pereira and Ruysenaar, 2012, p. 46 citing Hagendijk and Irwin, 2006; see also Dalton, 1959 for early examples).

[15] For the RDP specifically, implementation soon faltered as "government lacked the capacity to implement it" (Visser 2004, p.111).

Bond (2005) also foregrounds such a danger: "the 'framework' would be kept intact, but the RDP's details—especially those where the Left made a strong stand—would get lost in the process", both in terms of developing the White paper and its implementation. In the end, the White paper presented "a potentially tasty menu for governance, satisfying "the appetite of big business" and fell short of tightening up the bureaucracy (Bond 2005, p.75).

> Officials were already doing very well to frustrate Naidoo's roving bands of hammer-wielding technocrats [and] caught on as quickly to learn … White Paper rhetoric … and how to make right noises and avoid threats to their survival.

Apart from a somewhat enduring rhetoric, if not an evolving RDP discourse, the RDP was replaced in 1996 by GEAR in terms of its macro-economic foundations and by sectoral strategies reflecting 'GEAR' approaches.

The shift to GEAR represents a paradigmatic reversal from growth through redistribution to redistribution through growth. An important difference here is that the former expected the state to conduct a people-orientated developmental policy. The latter saw South Africa's economic "salvation" in higher economic growth rates, which would "result from a sharp increase in private capital accumulation in an unbridled capitalistic system" (Visser 2004, p.9; see also Terreblanche 1999). The revisions of GEAR could be interpreted in two ways: as policy where a

> left-of-centre government that had shaken off old ideology and pragmatically adopted a macro-framework consistent with global economic realities or that it had embarked upon and ideologically-generated neo-liberal policy, which would undermine the goal of redressing the gross inequalities of the apartheid period' (Weeks 1999, p.796).

As a macro-economic or fiscal policy, GEAR was successful; however, there is some dispute as to its 'developmental' benefits.

Others argue that GEAR is not to blame for the economic woes of the country. Rather, poverty and unequal wealth distribution is rooted in the lethal cocktail of poor education and high unemployment (Bruggemans & Slabbert 2003). What is clear is that it marks a clear ideological shift on the part of the ANC but one yet unable to deliver sufficient redress to South Africa's poor and most vulnerable citizens. There were pragmatic implications of GEAR, not only in terms of intended outcomes (fiscal discipline, etc.) but also for policymaking itself. There was before

GEAR a strong focus on participation but also on successive drafting procedures, evolving from Green to White Papers (see below). With GEAR, the conditions were not negotiable, setting into practice a new approach to policymaking in which policy shifts occur in a characteristically sudden fashion, without elaborate consultative procedures (see also Table 1 above).

The Shifting Development (Policy) Context: Constructing the Second Economy

Subsequent to GEAR, the Accelerated and Shared Growth Initiative for South Africa (ASGISA) was developed to push the South African economy towards a target of six per cent growth. Redistribution remained an overriding theme in early macro-economic policy (1990s), although it has subsequently lost ground to other priorities, economic growth being the enduring feature. Another important theme emanating from Thabo Mbeki's incumbency (1999-2008) and one permeating development thinking in the country, including the Biofuels Industrial Strategy, is that of the dual economy. The second economy, as Mbeki described in 2003,[16] is a marginalised economy disconnected structurally from the first. To Freund (2010) such a view revives critical liberal economics from the apartheid era (citing Houghton 1971; Wolpe 1972; Natrass 1981) but should by no means be simplified in the way it has been in policy rhetoric.

As a recurring theme in the biofuels debate, it is useful to examine the social construction of the second economy further (see also Du Toit 2012).[17] After becoming popular in ANC rhetoric much like 'RDP-speak' beforehand, it did not take long for the idea to attract critical reflection. Policymakers and academics on the left were quick to take up the charge. Primarily, academics have attacked a literal interpretation of the second economy (Hadland 2007; du Toit and Neves 2007; Cf.

[16] At least two records of his use of the term are in 'ANC Today', Letter from the President: *Characteristics of South Africa's first and third world economies* (28/08/2003) and in an address to the National Council of Provinces entitled *The second economy, what it is and what is needed to meet the growth and development challenges it presents* (11/11/2003).

[17] By 'construction', I am guided by post-development theory and its critique of development theory by which, architects of 'development' automatically assume an existing framework through which development is to be implemented. Such a social construction is then not only a product of existing norms and institutions but these too control its continued outcomes (e.g. Sachs 2010).

The Presidency, 2006), which inevitably leads to problematic policy solutions in which the first is a benchmark/solution to the second (Philip 2010).

Although the second economy appears conceptually (and therefore metaphorically) precise, there are practical considerations that do not stand up to scrutiny. The disjuncture arises from confusing outcomes—a dualistic economy— with processes through which they are created (Philip 2010). The issue then is that the idea of a structural disconnection conflates the dichotomy of outcomes (rich and poor) as being the same as a disconnection in process (dispossession and exploitation). The two are very different and the apparent structural disconnection is perhaps better considered as adverse incorporation (du Toit & Neves 2007) or a relationship of asymmetrical interdependence (Von Holdt & Webster 2005). Despite there being a complex duality in the South African economy (see next chapter and Appendix C for discussion), the deep inequality suggests both ends of the spectrum—constructions of the very rich and very poor—are a form of distortion and antithetical to an inclusive society (Philip 2010). The 'first economy', characterised by conspicuous consumption, is inappropriate as a benchmark for salvaging the disconnected 'second economy'; Hettne (2009) would compare this to a myopic focus on 'transition' rather than the more challenging task of transformation of the economy.

It should be noted that the Second Economy Project initiated in 2007, which looked into the impact of programmes aimed at the second economy (taking the dichotomy for granted), concluded with a strategy document in 2009 suggesting that there is no disconnection but the two are a feature of high inequality (Cf. Philip, 2010). However, the importance of the second economy for this thesis is its role as a powerful overarching political motif during the development of the biofuels strategy. I will return to this later but, as an example, it is useful to see that when the Accelerated Shared Growth Initiative of South Africa (ASGISA) was announced by Deputy President Phumzile Mlambo-Nguka in February 2006, its aims included "eliminating the second economy" (Phumzile Mlambo-Ngcuka, 2006).[18]

[18] It is important to mention that bioenergy—particularly off-grid, small-scale interventions as part of hybrid renewable energy platforms—are probably of immense benefit to solving the problems of the so-called 'second economy'. These have apparently being marginalized by industrial biofuels hegemony; a point I take up later in the thesis.

If the second economy was the defining feature, if only metaphorical, of the development challenge in South Africa, responding to it was equally proverbial. Although explicit strategies such as GEAR, ASGISA, and the New Growth Path, present specific macro-economic agendas for the country, the philosophy of the RDP also appears to have been rearticulated now in the form of South Africa as a 'developmental state'. The idea here is that the state has a central role in development, which is as obvious as it is complicated (see discussion in Ayee 2013). South Africa's status as a developmental state is one of self-proclaimed interest and appears provisional (Fine 2010; Turok 2010), rather than extant and pragmatic, as was the case first of Japan (Johnson 1982) and then of the Asian developmental states thereafter (Leftwich 1995). That is, in South Africa, it is less about acknowledging an outcome that has come to pass through specific processes and more about promoting certain 'means' to achieve such 'ends' (even if these may differ significantly from that of the original 'developmental states'). Of course, one has to accept that an emulation of the East Asian development states is perhaps neither realistic, nor coherent (Butler 2010). From a policy perspective, such a situation seems to suggest, however, a state that has perhaps over extended its aspirations and under extended its capacity, which creates fertile ground for external influences, as we shall seen in the case of biofuel production.

CONCLUSION

The start of this chapter began by describing that South Africa is a developing country, with the government facing a number of deepening challenges. Not only is the ANC government plagued by capacity issues and dramatic shifts in its broad developmental policy (from the optimistic RDP to more conservative and economically focussed GEAR and finally the rhetorical ASGISA), the developmental challenges are amongst the most extreme in the world. The transition to democracy has thus imparted new freedoms to the country's people but change has been slow and has not translated into economic freedom. The shift has also meant new processes in policymaking. Although not dealt with in detail, it should also be mentioned that South Africa is also part of the global economy, which circumscribes

macro-economic policies but also implies South Africa has to confront emergent global challenges (Marquard & Eberhard 2000).

All of these challenges are in some form the subject of policies and confronted by policymakers within the country. We could conceptualise the processes through which these policies are made as generic models, resorting back to linear conceptions. The challenge or gap in such generic conceptions of policy is that they fail to interrogate the complex links between actors involved in the process. In a similar way, there also needs to be a distinction made between the prevailing ideals of NPM and technical approaches above and the messy processes that do (and should) occur. It is here, for example, where concerns that 'professionalising the policy process' means losing sight of citizen-based democracy (Edigheji 2005). Similarly, although not explicit in their reviews, critical scholars have raised important insights emanating from existing reviews of development policy, although have not framed these within specific theoretical frameworks (whilst also potentially falling into the overly critical category of development policy critiques defined by Mosse (2004)). This is a discussion I take further in the empirical chapters of the thesis but, at its simplest, revolves around how these policies are made and continue to be made both 'politically' and 'rationally'. Bond (2005) presents a useful, ethnographically orientated, policy study, drawing on his experiences within such a process. While I have not had such an appreciable role in the South African biofuels policy's development, I ultimately aim to unpack it in a very similar way. The important point is that while an ethnographic approach is indeed informative, there is added utility in presenting a framework with which to organise the issues that appear to dominate, though with a flexibility to incorporate nuance. This is the value of the framework approach outlined in Chapter 2, as a scaffold to review the biofuels policy interpretively. This creates some room for such reviews to evolve into a more systematic empirical project in South Africa. The next four chapters present my addition to such a project.

CHAPTER 4: PROVINCIAL BIOFUELS 'POLICIES' AND A SNAPSHOT OF BIOFUELS PROJECTS IN SOUTH AFRICA

> The team leading government on biofuels has recommended that the Cradock project be used "as a case study for this sector," Energy Minister Dipuo-Peters has told a Renewable Energy Summit in East London (citing Dipuo-Peters, 2012).

If there is one thing a multiple streams model of policymaking tells us, it is that demarcating a clear start for any policy development is relatively difficult, as each stream, rather than the policy itself, has a source. Circumscribing the 'policy window' in which each stream comes together is equally tricky. In this Chapter, I digress somewhat from a discussion of the national policy, which is the subject of the following three chapters, and look rather towards the early projects proposed, the projects that have survived and how these have informed a separate policy development in the Eastern Cape. The digression is a necessary one as, not only does it preview and reinforce some of the arguments I make about policymaking in general but it also introduces some of the complex networks that cross the provincial/national boundary and permeate the national Industrial Strategy as well.

To foreground the discussion of this chapter, the popular story of the South African biofuels industry is that there has been a rise and demise of a range of projects (see discussion of Table 2 below), most notably a number of maize-to-ethanol plants, though they were not alone. The industry blames the policy and its so-called shortcomings—lacking incentives and no mandatory blending—for the projects' ultimate demise.[1] That is, despite an initial (perhaps premature) enthusiasm, the early demise of the biofuels industry was considered a failure of the strategy itself. Such a situation opens up two important lines of enquiry. The first is the anticipation and construction of success. This is a point to be taken up later when I review how political decisions rejected multiple commercial interests and their aspirations for a business-cum-agro-industrial-friendly policy. I hope to extend the debate further than

[1] It should also be mentioned that despite some authors (e.g. African Centre for Biosafety 2011) dismissing the biofuels sectors as a "non-starter", the future is unclear and it would be entirely wrong to write off the tenacity of certain actors within a wider biofuels assemblage.

inadequate support mechanisms[2] within the policy spelling out a swift demise for projects and the conflation of policy failure with that of failed expectations. The second line of enquiry, one not unrelated to the first, is to suggest that this so-called demise of the biofuels industry is not as clear as people within the industry (and those outside of it – see African Centre for Biosafety (2011)) suggest. The point is to look at the projects—in this case the Cradock sugar beet and Phyto*Energy* canola projects in particular—not as independently susceptible to but rather embedded (if not foundational) within these wider policy processes.[3]

As the governments' vanguard project, the Cradock project in the Eastern Cape is an important cog within the national biofuels machine. It acts as a type of contact zone in which implementation (and more so the project supporters) are fulfilling not only practical aspects of implementation but renegotiating the very foundations of the strategy, as they have done so through much of the policy process. The canola project on the other hand, has informed a different set of interests, with equally divergent approaches and standings within the broader policy process. To date both have been 'unsuccessful' as biofuels projects insofar as actually producing biofuels. The projects are, however, important to the policy process (an on-going one), or at least are an integral part of the policy system/community and success in this situation has a distinctly relative point of view. I have grouped the canola and sugar beet projects together into one 'project stream' only to illustrate their place in a wider policy system. At the project level, they are polar opposites. The second line of

[2] The importance here is that in many interviews I was immediately criticised for referring to an 'industry' as no such 'industry' exists (at least not yet). The previous chapter has already alluded to why this would be the case, in that the *final Strategy* itself was devoid of incentives and, according to whom one is speaking, turned its back on the industry by excluding maize and *jatropha*. Over and above the lack of incentives, another major downfall of the Strategy and its pending implementation is the absence of mandatory blending. In the feasibility study, this was a mechanism necessary to sustain the fledgling industry. With no mandatory blending, there is no demand, which also sends out the 'wrong' market signals. Such a scenario has resulted in many of the original international investors now looking elsewhere, while local investments became immediately untenable. Those projects able to continue (that is with continued access to funding) have now had to take control of policy negotiations in order to get the implementation process back on track.

[3] Considering the 2007 decision as the final decision is ahistorical and fatalistic, as later chapters will illustrate. Although many projects never materialised, there has been on-going reworking and negotiating of the final decisions taken. Two bioethanol projects—Mabele in the Free State and ARDA/Sugar Beet SA in Cradock—and one biodiesel project—Phyto*Energy* in the Eastern Cape—have been continuing to lobby with the Biofuels Task Team and have managed to, along with other factors, sway decisions and shift the level of support provided in 'the policy' after it was released.

enquiry thus extends or anticipates the existence of a wider policy subsystem, recognising also that such policy collectives—relatively stable aggregations of people from a range of organisations who find themselves thrown together on a continuing basis to address policy problems—are not inherent from the start but rather emerge (Colebatch 2009a). To begin with, in the next section, I will briefly outline the 'status quo' of biofuels in South Africa before looking more closely at the project-policy interface at the point in time before the strategy had done its so-called damage. Added to a general overview, I shall consider the project (and therefore policy) proposals and the possibilities they present to rural development, which was the overriding driver behind biofuels at the time. Of course, as one of the central goals of the biofuels policy, the rural development context and the counterpart projects is an important part of the story.

CONTEXTUALISING 'WIN-WIN' NARRATIVES: RURAL DEVELOPMENT AND PROPOSED, PAST AND PRESENT BIOFUEL PROJECTS IN SOUTH AFRICA

A major theme of the global biofuels discourse, and its most provocative narrative in developing-country contexts, is that of revitalising rural economies and boosting their agricultural sectors. What sets biofuels apart from other renewable energy solutions is that it is directly linked to rural development and agricultural reform given the demands it places on agricultural products. Although scholars increasingly consider the nature of rural development itself as highly contentious, with far greater emphasis on rural heterogeneity and moving towards a 'new narrative' or post-Washington Consensus (e.g. Maxwell & Ashley 2001), there appears to be a clear focus on homogenising agrofuel production to ensure suitable economies of scale (visibly large-scale industrial agricultural production) to meet rising demand. This import-driven demand arises mainly due to mandatory blending ratios in the European Union (EU), whilst policies in the United States (US) have resulted in a significant increase of feedstock used for biofuels production and thereby changed global agro-commodity markets (Banse *et al*. 2008). Regardless of the uncertainties and contextual nuances of rural development (see below; Appendix C), by creating new and increased (supposedly endless) demand for agricultural produce from developing nations—so the narrative goes—biofuels are considered to play a pivotal

role in the agro-economy. In South Africa, the possibility of new biofuels markets, be they local or international, enthused local producers given the oversupply of agricultural produce (and resultant boom-bust price shocks) in the local market—for maize especially. Given the potential benefits and rising interests of pursuing biofuels production, early on the South African government were clearly considering them as a serious developmental issue.

When first engaging in my research, and due partly to my involvement with the PISCES consortium, I was struck by the underlying logic of rural development within the national biofuels strategy and what seemed to be a contradiction when looking at the projects being promoted. In Appendix C, I provide an extended review of rural development in the South African context. A lengthy discussion is not necessary here, but some points need to be reiterated. The main argument is that biofuels have become a development solution that easily falls within a wider social construction of the South African rural political economy, which comprises of a so-called 'first' and 'second economy'. This narrative of two economies, which also underscores ASGISA, emerges from the very real situation in which there remains a massive inequality (not just in rural areas) resulting from past exploitation and dispossession. The rural economy is thus split into a predominantly White commercial and industrially orientated large-scale farming sector with a predominantly black, peasant agriculture alongside it (sometimes the two share adjacent fences and similar resources).

The duality of South African agriculture is increasingly becoming important as ideological viewpoints confront one another. The commercial sector, driven increasingly by concentration and industrial-modernisation logic are largely set against smaller-scale traditional farming or peasant logic. The governmental response in South Africa has largely being fashioned with a rhetorical bias towards the former, in which peasant farmers need to undergo a *transition* to commercial-industrial operations despite macro-economic frameworks and policies somewhat undermining their potential to succeed. This confrontation also exists, or is best illustrated between different departments within government. The Department of Land Affairs, for example, emphasises state subsidies for emerging farmers whilst

the Department of Agriculture is increasingly deregulating the agro-economy. As Cousins and Hall (2013) argue:

> [t]oday commercial farming is increasingly concentrated in a shrinking number of very large enterprises, still mostly white-owned; while on the other, after more than R53 billion has been spent on state-driven land reform since 1994, only about eight per cent of commercial farmland has been transferred to black farmers, many projects have experienced problems and the number of small black famers has not increased substantially.

Little is said about transformation of one sector or the other, whether in terms of sustainability or in terms of redressing the ills of the past. Even with the commercial sector experiencing a growth in the number of black commercial farmers, they face similar challenges within this sector—from harsh climates to risky markets—that ultimately close out possibilities of their success. There is also a (political) focus on *transforming* the agricultural sector as a whole—generally reducing a multiplicity of goals to simply replacing white farmers with black ones—while maintaining national food sufficiency and a productive sector (Pieterse & van Wyk 2005) but the links between these two goals are complex and remain blurred. As a development solution, biofuels has also encountered current and 'future' plans of *restitution* and *redistribution* within the agricultural sector, though the performance of land reform in general has been lacklustre (Lahiff 2008) and, according to recent news reports, little has changed with the addition of biofuels (Kings 2012; Radebe 2012; Sonjica 2013). It is also worth noting that although biofuels appear apt as a Washington-Consensus style 'quick fix" for South Africa's rural development quagmire, such approaches to development have proved more tricky than neo-classical textbook stories suggest (e.g. Jacobs 2009).

Biofuels Projects in South Africa

In 2005, there was much hype in South Africa about the promise of biofuels. Historically, South Africa's relationship with biofuels began in the 1920s when ethanol derived from Sugarcane was mixed with petrol (Blanchard *et al*. 2011). Following global trends in the mid-2000s, agricultural lobbies, agribusinesses, and commercial farmers in South Africa latched onto biofuels as a potential new (and endless) market for a domestic oversupply of maize and new profit streams for existing commodity chains. This is not as new a phenomenon as one might expect.

Officials within the Department of Energy and National Treasury suggest that there have been numerous occasions when maize farmers have lobbied government to support biofuels.

> *In the 70s, there was a renewed interest driven by maize but after that, it died out [because] it was more expensive than fuel and there were technological issues as well. Then, when the new government came in, there was a stigma attached to biofuels as it is what the last government tried to use to overcome sanctions etc.* (Former BTT member A, 2012).

Why these maize lobbies were never supported is probably more complicated than the above quote suggests but what distinguishes their lobbying this time around was that the maize lobby were not alone. One can see this by the number of biofuels projects (Table 2) that were being proposed at the time the national strategy was being contemplated, circa 2005. I compiled Table 2 in the early phases of the research, using secondary information from news reports (especially from EngineeringNews.co.za using articles published in 2005 and 2006) as well as meeting with project managers and department officials dealing with the individual projects, licensing agreements and incentives (especially from the Department of Trade and Industry). I have kept it complete, which actually makes it dated and inaccurate, purely to illustrate the extent of the hype and activity at the time (and even this list was not entirely complete). Only three of these projects—Cradock, Phyto*Energy* and Mabele—are presently 'active'. Active here does not mean producing biofuels, but rather continuing as funded entities, although one could add in a fourth project—Hoedspruit to this list. These projects have had the financial backing to continue to exist (whether on paper or in practice) while the government refines and confirms regulatory measures and incentives, on which most of these projects rely. In the map (Figure 2), I have highlighted these projects as the 'Big Four'.

Table 2: Outline of biofuels projects in South Africa			
Project[*]	Description	Partners	Status (2005-2012)
Hoedspruit Ethanol Plant in Mpumalanga	Sugarcane and sweet sorghum to produce 100 million litres (see Haywood *et al.* 2008).	CEF and IDC partnership.	This project appears to be feasible, however, has stalled pending a final decision on the incentives and other details of the strategy. The IDC are focussing on Cradock before implementing Hoedspruit.
Cradock in the Eastern Cape	Originally proposed sugar beet for ethanol to produce 90 million litres of biofuel a year from sugar beets (see Haywood *et al*, 2008).	IDC and Sugar Beet SA (also known as ARDA and now owned by Provincial Government).	Stories vary but this appears to be the most developed "agrofuel" project at present. There is, however, no refinery in place (i.e. no production) and only pilot sugar beet feedstock plantations were planted, however, they have now shifted to grain sorghum to kickstart start the project (i.e. no feedstock is available).
Makhathini in KwaZulu-Natal	Sugarcane and cassava for ethanol production.	*Ubuhle*[†] (with IDC and CEF initially).	This project has taken on a co-operative approach managed by a company called Ubuhle. They are currently looking for funding to proceed. CEF and the IDC appear to have pulled out of the project and in my last discussions with the project manager, he was waiting on funding to proceed.
Tongaat-Hullet in KwaZulu-Natal	Sugarcane to produce bioethanol.	There are two projects noted in various reports, one in Makhatini and one near Tongaat. As Tongaat-Hullet has produced bioenergy from bagasse, there were rumours of moving to biofuels but nothing has been officially confirmed. Until recent changes in the Sugar Act, there was little enthusiasm for biofuels from sugar producers.	
Bizana and	Sugarcane and sweet	An IDC partnership with J&J	According to a project manager, the feasibility looks

[*] Most of these names are towns or areas in which the projects were proposed; as none has really come to fruition, their actual names are not readily available.
[†] *Ubuhle* is the isiZulu word for beautiful.

Paddock/Izingolweni in Pondoland	sorghum for bioethanol.	Bioenergy.	good and land is being secured, but no ethanol is being produced. The IDC is no longer involved and funding has not been obtained. Legislation has also been problematic.
Phyto*Energy* at the East London IDZ, Eastern Cape	Biodiesel plant to process canola planted through the Eastern Cape Biofuels Integrated Cropping Programme.	Originally Thussen-Krupp, Phyto*Energy*, Asgisa-EC and KPMG. Asgisa-EC has left the project and Phyto*Energy*'s subsidiaries (Phyto*Farming* and Phyto*Amandla*) are working with the KPMG and DTI.	This project has been underwritten by German interests (Phyto*Energy*) and an off take agreement has been (or is ready to be) signed. At present, no production has occurred and there have been significant delays in establishing the refinery. As the national strategy has prohibited export, it is not clear how an off-take with Germany would work. The project has also benefitted from incentives through the controversial arms-deal offsets and internal reports suggest some financial irregularities further clouding its reputation. A feasibility study was produced by KPMG South Africa and Phyto*Energy* whilst pilot projects continue. Asgisa-EC was a partner in the early trials but no longer remain part of the project.
Rainbow Nation Renewable Fuels at the Coega IDZ, Eastern Cape	Biodiesel plant using Soya (ostensibly from the Eastern Cape Intercropping Programme) and imported 'soya cake'.	Australia-based National Biofuels Group is the primary shareholder	Although the first project to obtain a license to produce biodiesel from Soya, the company has yet to set up a refinery and if funding is secured it will still be a few months before operations begin. The project will take advantage of a gap in the Soya market chain by importing oil rich cake (not enough is produced in South Africa) and selling off the protein cake for livestock after extracting the oil for biodiesel.
Sasol/Siyanda	A biodiesel project based	Sasol, CEF, Siyanda Biodiesel	This project was put on hold after the *final* Strategy

Soya Plant in Secunda, Mpumalanga.	on Soya.	(Pty) and Lurgi South Africa (a subsidiary of German based Lurgi AG).	was released. From a discussion with former project managers, the project was financially not viable without government support.
Mabele Fuels[*] (formerly Ethanol Africa), Bothaville, Free State.	Originally planned to produce ethanol from maize in Bothaville (Free State) the plant was to have capacity to produce 153million litres of fuel-grade bio-ethanol per year [although this seems excessive/exaggerated] and was expected to come online in 2007 (Anon 2006). By excluding maize, the strategy derailed these plans.	Reports vary. "Energy Development Corporation (EDC), a division of the state-owned Central Energy Fund, is to buy a 25.1% stake in Ethanol Africa" (Alexander 2005). Ethanol Africa was a consortium of commercial famers and other private investors including Sterling Waterford, who had a 50% share. The project was then financed by Sterling Waterford and three other large investors (proshare.com) but details are hazy.	The 'first' licensed Bio-Ethanol project in South Africa funded by Sterling Waterford. This project was one of a number of (unrealised) maize-to-ethanol projects planned in the Free State, North West and Mpumalanga Provinces. Originally a consortium of private interests, Sterling Waterford remains the major investor and proposes a sorghum-to-ethanol plant to bypass the 'maize ban'. The subsequent cluster of seven distilleries in the Free State, North-West and Mpumalanga (Sugrue & Douthwaite 2007), were to be commissioned from 2008 to 2012 but never happened. The Bothaville project was approved for Strategic Investment Project (SIP) incentives in 2006 with a SIP tax credit of R 53million granted.
Mafikeng Biodiesel Company, North West Province	Biodiesel produced from *jatropha* (with research looking into Moringa and other indigenous trees).	Public-Private partnership between University of Pretoria and Invest North West (part of the Department for Economic Development and Tourism.	This project was supposed to produce biodiesel from *jatropha*. According to Diaz-Chavez *et al*. (2010), commercial production of *jatropha* for this project was given the go-ahead in 2007, whilst former members of the DME described it to me as defunct in 2010. In meetings with officials from the North West, the project was in the process of being 'legally dismantled' in 2011. As *jatropha* was excluded from

[*] *Mabele* is the Northern Sotho word for sorghum.

			the *final* Strategy, it is unlikely there would have been adequate support post-2007, however, respondents also noted "institutional challenges" within government.
Silversands Bioethanol Gel Project Northwest Province	Ethanol Gel from Sugar beet.	CEO Derek Mathews is a commercial famer that has created a vertically integrated farming-biofuel operation	Although changing feedstock from maize to Sugar beet this project has managed to maintain production of ethanol gel for clean-cook stoves and employs local farmers through a co-operative system. There are plans to collaborate with a bus company in Johannesburg to run on 'green fuels'.
Mapfura-Makhura Incubator (MMI) near Marble Hall in Limpopo	Sunflower and Soya for biodiesel.	A project developed by the Agricultural Research Council (ARC) and funded by the Department of Science and Technology and the Limpopo Department of Agriculture	This project is more of a smallholder agro-development initiative and is currently not producing biodiesel but cultivating sunflowers. At present (due to limited funds to set up a refinery), the farmers are selling their feedstock into the vegetable oils (sunflower oil) value chain rather than biofuels per se. This project is assisting about 90 farmers, of 10 ha each, around the Sekhukhune area (Haywood *et al*. 2009).
D1 Oils, KwaZulu Natal or Gauteng	Bio-diesel with output up to 15,000 tonnes using imported vegetable oil (*jatropha*) from D1 plantations in Mozambique and Zambia	D1 plc (UK) and Rolls-Royce (UK) 90%; PetroSAF (BEE) 10%	Location was initially Durban, but then planned to relocate to Gauteng for logistical reasons. Project was never completed. The project was approved for offset incentives, a site was identified in Krugersdorp Gauteng, an EIA submitted and operation expected to begin in 2006. Official in the DTI suggested the project stalled after the *final* Strategy was passed.

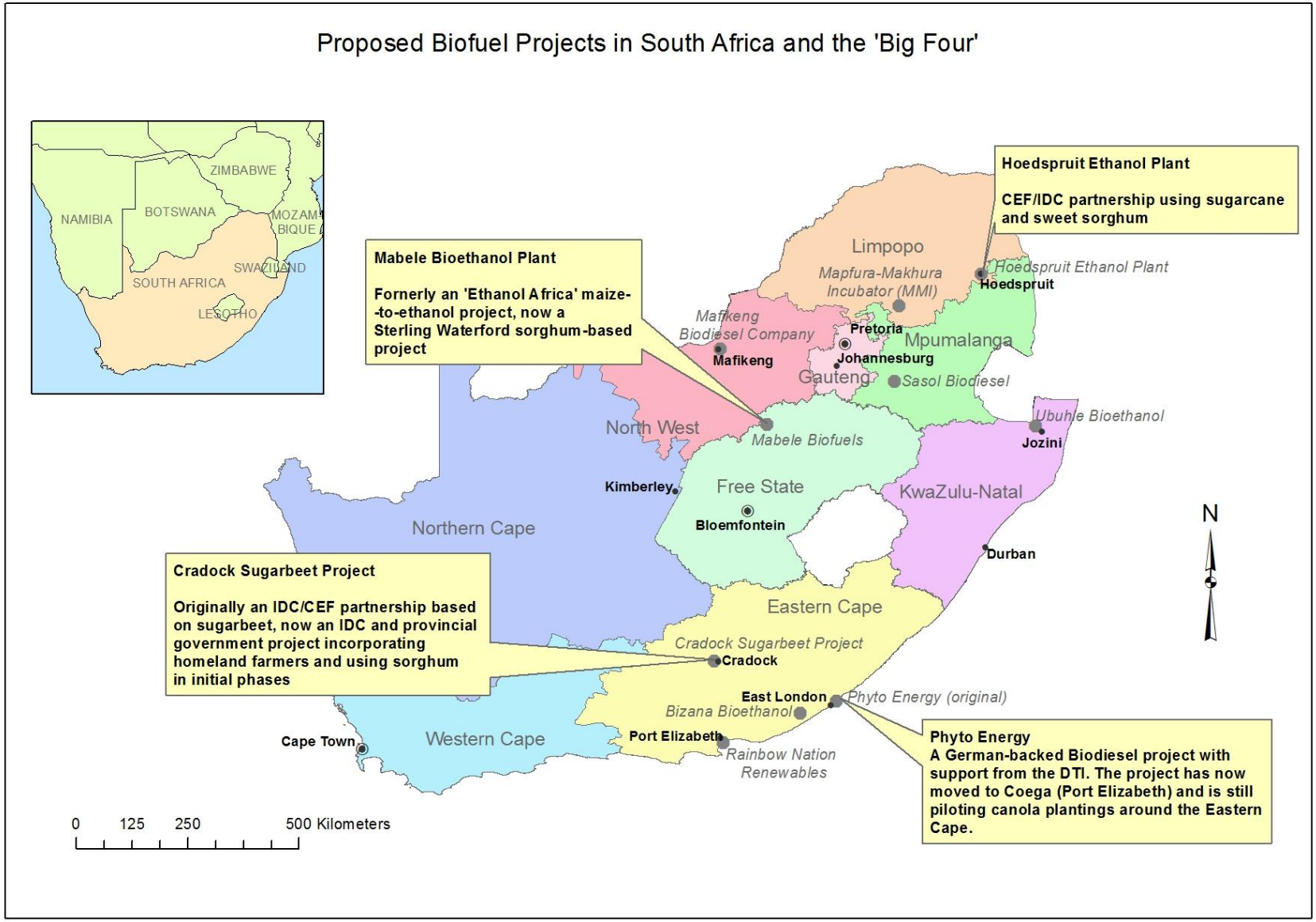


Figure 2: Map of South Africa's major proposed biofuels projects (author's own work)

The privately funded Mabele project (owned by Sterling Waterford) and Cradock (financed by the Central Energy Fund and Industrial Development Corporation) are bioethanol projects that are currently key players at national level. The Phyto*Energy* canola project is a key player in the Eastern Cape Province but until recently has struggled to gain requisite political support outside of the a few 'hopefuls' at national level.[1] It has also encountered tensions when working in partnership with provincial agencies ASGISA-EC, in which growing canola trials in the Eastern Cape has proved extremely difficult. One could argue that it is as 'active' as Mabele and Cradock although as a biodiesel project has not played a particularly direct or influential role in terms of the national policy development (at least not the early policy of 2007). Hoedspruit is a fourth major project that, once the strategy is finalised will be the IDC's successor to Cradock, which, as the ministers quote above suggests, is South Africa's vanguard project during the pilot phases (2007-2013). I will unravel some of the nuances of these projects in later sections.

Dominating this list of projects were the ones proposed, facilitated and funded by parastatal agencies and programmes specifically funded by government to kick-start a biofuels industry in the country. Primary funders of the industry, at a national level, include the Central Energy Fund (CEF) and Industrial Development Corporation (IDC). The CEF is the financial 'arm' of the Department of Energy, providing funding to energy related projects and providing technical support to the DoE. Within the CEF, there is then the Energy Development Corporation (EDC)[2] that has been described as (Wilson *et al*. 2005, p.47):

> …established in January 2004, [the EDC] is a commercial arm of CEF and, being close to policymakers, is well placed to act on new initiatives and policies that emerge in the energy sector. EDC is well-resourced organisation focusing on a number of [renewable energy technologies] RETs: solar energy, wind energy, hydro energy, biomass, biogas and low smoke fuels and supports energy development through commercial, developmental and social projects that meet the goals of NEPAD and SADC. EDC is committed to a policy of broad based Black Economic

[1] Phyto*Energy* SA, as South African subsidiary of the German Phyto*Energy* Group has its project managed by secondments from KPMG and has had significant support (mostly financial and somewhat political) from the Department of Trade and Industry.

[2] The website of the EDC describes its role as follows: Being close to the policy makers, EDC is able to lobby the relevant government departments and institutions for support when necessary. At the same time it operates as a fully commercial entity

Empowerment (BEE) by ensuring that it maximises procurement from appropriate sources.

The Industrial Development Corporation (IDC) are also a financing institution, set up by the government in 1940; it remains owned by the South African government under the guidance of the Economic Development Department and also has a significant share in Sasol (Hodge 2000). Together with the CEF/EDC, they have been part of a policy network with the Department of Energy (amongst others) at national level (see Figure 3), which will be described later.

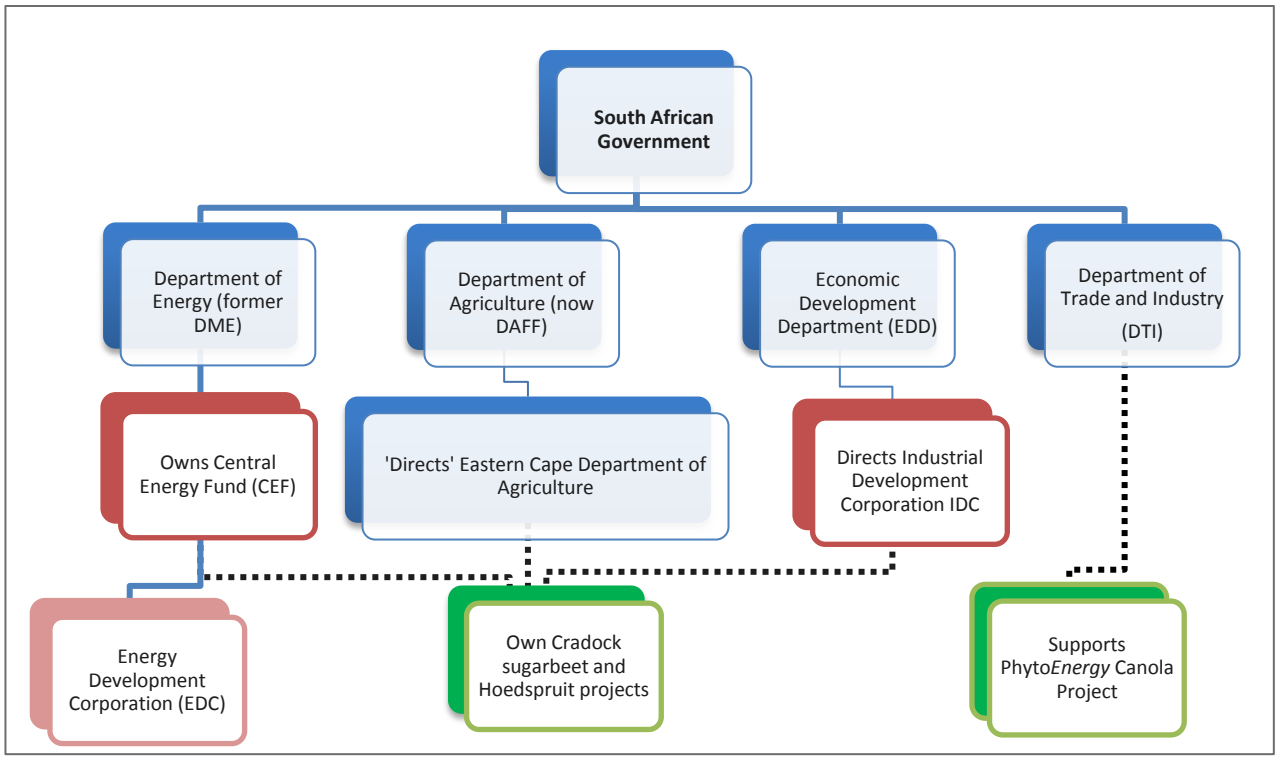


Figure 3: 'Organogram' of government departments and associated biofuel projects

It is through the Cradock and Phyto*Energy* projects that the Eastern Cape becomes important for the biofuels policy's development (beyond the political significance of it being a former homeland, home to many of the ANC elite, including Nelson Mandela, and a long-term development frontier in South Africa).[3] At the provincial

[3] The Eastern Cape Province is a product of the transition to democracy, in which part of the former Cape Province and two former homelands (the Transkei and Ciskei) were merged together. As Schmeding (2009, p.8) describes, "the new province was to inherit a host of burdens of failed politics, neglect, under-development, lack of long-term and consequent rural and industrial sustainable development planning as well as implications of African traditions". The Eastern Cape is home to the Wild Coast, and important cultural, scenic and ecological region, and a rural

level, Asgisa-EC and various provincial Departments—Agriculture and Economic Development (or similar)—formed an interlinked and complex network of government agencies pushing forward the biofuels agenda, with private capital interests also contributing significantly. Asgisa-EC is especially important but will be discussed in later sections.

I have also shaded two projects in Table 2 that depart from the large-scale mind-set displayed by the other first-generation biofuels projects described above. The first, Silversands Bioethanol, is a small-scale private operation run by Derek Mathews, a local commercial farmer. Originally producing ethanol gel from maize, sugar beet has since become the preferred feedstock[4] and there are plans to collaborate with City of Johannesburg to produce 'green fuels' for their buses. The project has survived without incentives, providing biofuels to a niche market, unlike the industrial projects. The second, the Mapfura-Makhura Incubator (MMI), is not a biofuels project *per se* but rather an investment platform to assist small-scale farmers in producing competitively for the market. Biodiesel appeared to provide one such market, although with the price of vegetable oils being well above their relative value as biodiesel and with limited support from government (i.e. no incentives and no mandatory blending), the project has focussed on the oil market alone. They too have some criticism of the strategy.

> *The strategy is a problem … because it has not formalised the sector so the DME [Department of Energy] has to work hard to get things right. I don't even know if they know that the MMI exists. At the moment, it is like we are in this alone* (Stakeholder interview, 2010).

Although multiple projects were proposed and South Africa was geared (agriculturally speaking) to produce requisite feedstock, a Global Agricultural Information Network (GAIN) report summed up the South African situation in 2009; there is no large-scale production (Esterhuizen 2009). This situation prevails at the

landscape characterised by traditional farming and tribal lands, high unemployment, and a lack of infrastructure and services.

[4] The decision for this was a cost-benefit one. Sugarbeet has high glucose content (rather than being a starch in the case of maize) and thus produces far higher quantities of ethanol than maize does.

time of writing in 2013. Such a statement deserves some context. There is no workable biofuel project from agricultural crops, despite many policy statements, plans for projects, debates, workshops *et cetera*. There is, as the above begins to highlight, a mix of project types that all have to be included in policy measures if the industry is to be managed and beneficial to all relevant stakeholders. The route South Africa has chosen in the strategy thus appears myopic and biased with the policy and project focus eclipsed by the industrial rationale (for reasons discussed later). Regardless, there is little actual emphasis as how such approaches are to meet the rural development prerogatives described above. To illustrate this point further, focussing again on first generation biofuels, it is worth examining the types of biofuels projects currently found in Africa (which itself is a problematic generalisation) and what they may mean for rural development and then reflect on the South African context through such a lens.

Project Types: African Examples and a South African Typology

In a review of projects across Africa, Wolde-Georgis & Glantz (2009) classify three emerging types of biofuel projects, which relate to different strategies for development:

- Large vertically integrated plantations directly linked and managed by biofuels refineries;
- Co-operative type contract plantations of biofuels crops by small farmers for sale to biofuels refineries; and
- Small-scale, village-level production with mixtures of both biofuels feedstock and food crops.

For each of these they add cautionary notes. The first two are potentially the most damaging, requiring significant government oversight to mitigate any environmental and social impacts. Large, vertically integrated projects can be especially damaging in this regard and the call for government oversight needs to be questioned in contexts when often it is the state that is implementing (or at least partners within) such projects (see Future Agricultures, 2011). The third category, which generally matches the existing rural economies in Africa, is also not totally innocuous and need to work within the:

> framework of local needs without disrupting the local ecology, and farmers are not alienated from their land or forced to wait until the benefits of biofuels trickle down to their level (Wolde-Georgis & Glantz 2009, p.8).

A range of case studies for the rest of Africa also illustrates the ambiguous nature of biofuels and their benefits. Whereas horror stories abound with "land grabs" becoming notorious of the 'biofueled future', other projects show a less menacing nature. In their multi-country review, Diaz-Chavez *et al.* (2010), in some ways, have renewed optimism for biofuels by highlighting that they can actually coexist with food security, and do so in many African countries. Drawing on the experiences of Tanzania, Kenya Mozambique, Zambia, Mali, and Senegal they conclude that co-ops for biofuels and food can be grown without major impacts on food security, however, this requires direction from well thought out policies.

Others suggest that questions of the real benefits of biofuels are intrinsic to local contexts, especially when disguised under the cloak of win-win narratives. Any optimism has to be tempered by work that comes to cautionary conclusions, questioning 'win win' outcomes (Matondi, *et al.* 2010; Ariza-Montobio *et al.* 2010). There is a strong sense that far more policy and regulation is needed (Molony and Smith, 2010) but there are equally questions of whether the outcomes of legislation and compensation are sufficient to promote livelihood opportunities (Sulle & Nelson, 2009). As an edited collection, even the works within Matondi *et al.* (2010) highlight complex local circumstances in which opposing narratives, be they empirically founded or not, can dismantle biofuels projects and their potential benefits, even when, for example, food security benefits were beginning to accrue (see specifically the Ghanaian example of Prosper Boamah (2010)). The biofuels special edition of the *Journal of Peasant Studies* also provides a range of perspectives through which one should view the 'messy' reality of foreign acquisitions and agro-industrial projects in general and biofuels projects in particular (see Borras *et al*. 2010).

Closer to the South African case, Haywood *et al*. (2009) provide a four-way classification of biofuels projects already evident within Southern Africa. Type 1 and 2 projects produce biofuels to meet local needs (Figure 4). These projects are typically small and have been initiated in several African countries including Mali, Ghana, Mozambique, Tanzania and Zambia. Aimed at only meeting local fuel needs,

Type 1 and Type 2 projects are not considered to have major negative social or environmental impacts; indeed, their proponents see potential positive impacts as did Wolde-Georgis & Glantz (2009). One should remember that the scale (meaning number of projects rather than absolute size) at which this occurs would influence the true impact and thus such appraisal is debatable and needs qualification. There is always a danger in assuming scaling-up will not create new unforeseen challenges, and scaling-up should be seen in terms of numbers of projects (i.e. the impact results from a multiplier effect) in addition to scaling up by an increase in size.[5] Additionally, as evidenced by field visits[6] in Tanzania (and for South Africa as described above; see Appendix D), small-scale producers and positive impacts are also hindered by lacking policy frameworks that could co-ordinate and integrate currently isolated projects, as well as provide a blanket of support to a neglected sector.

In contrast, Type 3 and 4 projects are dedicated biofuel production enterprises (so-called "agrofuels" or "ergo-culture" projects established specifically to meet the demands for national and international fuel blends (see Mathews, 2007)). Farmers benefit from cash income rather than fuel security. Large corporations are the main investors in these types of projects. The magnitude of Type 3 and 4 projects could result in extensive land transformation, consequential biodiversity losses, unintended negative social consequences such as food insecurity and communities displaced from their land. Their appropriateness is questionable, especially in developing countries (Woods, 2006).

[5] At the same time, large-scale projects are too easily demonized. They may well be fortuitous through economies of scale and, whereas one should not consider large industrial farms as being environmentally friendly and not having some forms of impact *per se*, the impacts from 'on-farm' biofuel production may be little more than existing agriculture being undertaken for food or cash.(Ruysenaar 2011a)

[6] PISCES field visit to Arusha, March, 2010.

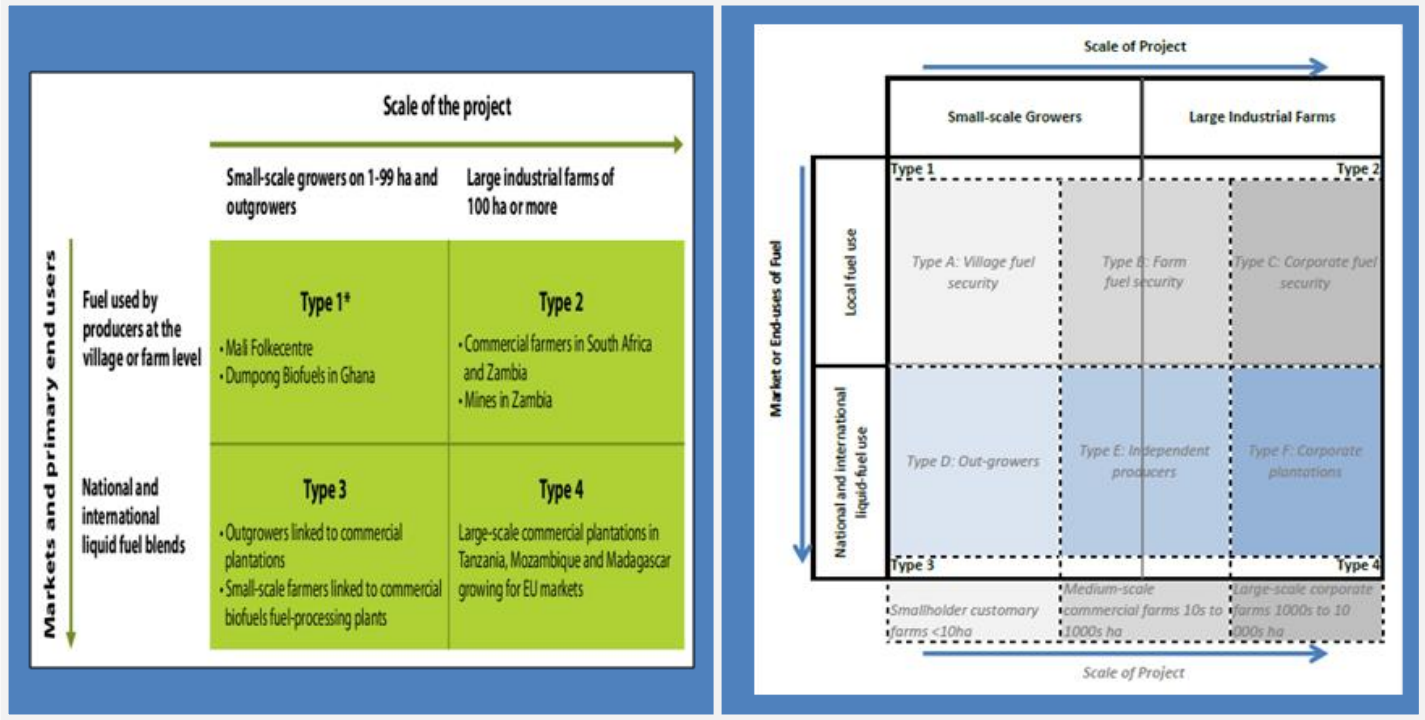


Figure 4a&b: Typical biofuel projects grouped by scale of farming activity and intended use of the biofuel product in SADC and South Africa (Haywood *et al.* 2009; Von Maltitz, 2011 in Ruysenaar, 2011b)

In a synopsis document compiled for the CURES network, I merged the findings of Haywood *et al* (2009) and a talk presented by Graham Von Maltitz (2011), to better represent the dynamics of the South African context (Figure 4b). The situation is quite different in South Africa, given the existing commercial farming sector with intermediate sized farms (10s to 100s of hectares) already occurring (outside of any specific biofuels industry). Thus the four-way classification (Figure 4a) is disaggregated into a further six categories (*italics* of Figure 4b). The intermediate farmers—Type B and E—have the potential to produce feedstock for biofuels refineries supplying the national fuel mix (for example the proposed Cradock sugar beet project) as well as producing for on-farm requirements respectively.

There is of course still the possible inclusion of corporate farmers and small-scale growers (which has also become a motivating factor behind the Cradock Project) but this relies on policy interventions (Ewing & Msangi 2009; Von Maltitz 2011). From a policy perspective, the government can coerce the use of different models and this, as mentioned, has been attempted in South Africa (see Chapter 1). The South African government, through the Industrial Biofuels Strategy, has preferred to support small-

scale and emerging farmers in the former homelands rather than existing commercial farms (Figure 5). Mechanisms to try to enforce this have included subsidies and constrained license requirements.

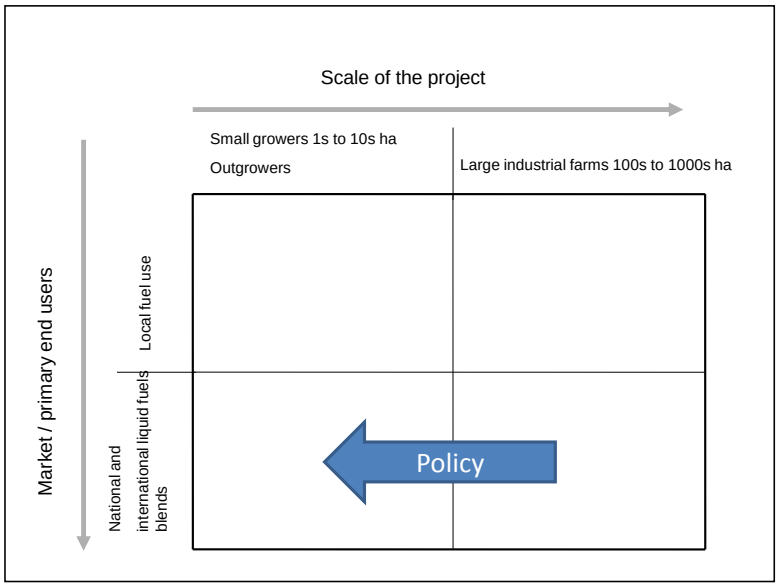


Figure 5: Using policy to re-orientate biofuels production approaches (Von Maltitz 2011 in Ruysenaar 2011b)

From the outline provided in Table 2, and the above discussion, it is obvious that (i) the majority of biofuels project are larger-scale (Type 4) projects and (ii) are either defunct or very slowly progressing. With a focus on the big four and Cradock especially, it is likely to prevail in the near future. There is an interesting dilemma here though. It can be linked to the arrow depicted in Figure 5, in which policy is used to re-orientate practices to match the desires of the decision-makers. What it neglects is how such policies may well co-evolve, that existing practices may define policy (even if not explicitly) and that, as Mosse (2004) suggests, success occurs when implementation related activities can be rearticulated within policy prescriptions. With some idea provided as to the projects occurring at the time, the next section turns to an illustrative case study of the co-evolution of the biofuels policy of the Eastern Cape.

> *While [the national departments] were doing the road show, there were interdepartmental committees that wanted to work on the biofuels development strategy and some of these international companies came [to provinces] and promised them huge money. And then [the province] said no, They want to have their own strategy, they were going to have their own strategy before the national strategy was developed! But that was also the same issue with Mafikeng because North West Province also had their own strategy. It was kind of a biofuels development strategy or framework or something. And as a province they went ahead planting jatropha* (Former Biofuels Task Team Member, 2011).[7]

An important aspect of the biofuels strategy that has not been considered in any of the existing literature is the proliferation of earlier policy proposals in the provinces. These have been similar in many respects to proposals of the national strategy itself, and have been subject to similar types of networks and influences. They also highlight the importance of project proposals in directing the strategic directions envisioned in the provinces, merging with and morphing existing practices and programmes. In my interviews and research, I have come across three of such initiatives—Eastern Cape, North West and KwaZulu-Natal—as well as biodiesel proposals being made in the City of Cape Town.[8] I will only focus on the Eastern Cape, as this was the most readily available and pertinent policy given that the case studies were also in this province.

Networks and Narratives in the Eastern Cape

In a confidential strategy document for the Eastern Cape, there appear a few main stakeholders including Ken Burn of the Eastern Cape Development Corporation (ECDC). According to their website, the ECDC were early investors in biofuels within the province. Despite being told by members of the ECDC in 2010 that they

[7] To provide some context here, Mafikeng is the capital city of the North West Province. The reason they were trying to plant *jatropha*, as I later found out, was that it was linked to a University of Pretoria research programme and also tied in with some spatial development programmes being run by the Province. I could not find out any definitive reasons as to why it failed, only that it was mainly 'political'. It is interesting to note that this respondent also continually referred to the policy as the biofuels development strategy, highlighting again the focus on job creation and rural development.

[8] I owe Simon Wilson a debt of thanks for his valuable insights into his work with the City of Cape Town and into the development of the national biofuels strategy in general.

were no longer involved with biofuels projects, their website (as of June 2013) still highlights (ECDC 2012):

> The Eastern Cape Provincial Government remains committed to growing the bio-fuels industry in the province. This is shown in the fact that 300 000 hectares have been earmarked for biofuel crops, such as canola and soya bean. The ECDC has been involved in growing trials for Canola and Soya Bean and these trial (*sic*) have proved extremely positive. In addition to this the Eastern Cape Provincial Government is in the process of finalising and formalising the provincial policy on bio-fuels which is directly linked to the national policy (*sic*). Once in place this policy will provide the road-map for bio-fuel production in the Eastern Cape.

Of the range of similarities with its national counterpart, the most significant is that its origins are, as will be shown, closely linked to project proposals for biofuels in the province and lobbying from within the private sector, the Eastern Cape Department of Agriculture and Land Affairs (ECDALA) and some of its affiliates. As an official from the ECDALA (ECDALA official B, 2010) described, when developing the policy, it was the ECDALA that took the lead. Ken Burn collaborated with Felix Hobson and Leon Coetzee (also from the ECDALA) to draft the policy, although it was considered more of a "desktop study". Together they formed an *ad hoc* task team under the Economic Growth and Infrastructure Cluster.[9] The task team would provide guidance to the cluster on biofuels and screen various applications of biofuels projects within the province, whilst also developing a business plan around canola. Once the policy was submitted to the cluster, it is questionable, according to this ECDALA official, whether it was taken seriously at all. "It was never really endorsed formally by the cluster. It just died a slow death" (ECDALA official B, 2010). Despite the claims of the ECDC quote above, which suggests work on the policy continues, the most important hindrance to the policy's development appears to have been the national policy. When the national government promulgated their strategy, it effectively neutered the provincial one, although one cannot discount that provincial backing for biofuels seems to have evaporated with the rsk of food-versus-fuel discouraging full support. (I discuss the food-versus-fuel debate at length later, for now it is important to note that the debate in the Eastern Cape followed a similar logic, politicians were wary about unintended consequences, whilst local biofuels

[9] The cluster system of government was established during the President Mbeki era and reconfigured during President Zuma's first term to foster an integrated approach to governance that is aimed at improving government planning, decision making and service delivery(The Presidency 2009b).

supporters called on the maxim of market principles to support the need for biofuels as a benefit to food security.)

There is more to be gleaned from the apparently swift policy demise. The first is that the process has been very similar to the national pathway described in later chapters, being concluded in the face of widespread hype by a network of similar interests, although encountering political and public objections, around not only food-versus-fuel but land rights and industrial large-scale approaches too. The second is the local contextual mobilising metaphors that deserve some critique. The third and closely related is how quickly biofuels narratives were co-opted into the development of the provincial biofuels policy but also that biofuels rhetoric informed (and legitimised) existing programmes and practices, garnering support for their continuation or slight adjustment. Such proposals need to be seen in relation to a wealth of evidence suggesting that their forerunners have not succeeded and yet continue to be advocated as a means for rural development. In this, my argument is similar to Seneque (1982, p.2) who suggests of such planning:

> [a]ll too often development planning is nothing more than problem-solving oriented: the problem is identified and described, and the planners put forward a solution to solve it. However, for a solution to have even a chance of being successfully implemented, the causes and history of the problem must be fully analysed and understood. It is just as crucial to analyse and evaluate previous attempted solutions to the problem. For, in failing, they may have become additional constraints, i.e. in themselves the previous solutions may have become part of the problem.

However, the activity of planning is also perhaps the source rather than the solution to such a situation. It is thus that these issues raised above for the biofuels strategy were not separate or mutually exclusive but interlinked and overlapping and are interrogated as such. They are presented in a general discussion next.

The above suggests an interesting isomorphism between the national and provincial strategy developments, until there was actually a re-writing of the provincial policy to match the requirements of the national strategy. Given the institutional arrangements of the DME, the Eastern Cape process was largely isolated from the national one, until provincial proposals were overshadowed by national ones following the national Biofuels Task Team's 'road show'. That the ECDALA produced an unpublished document entitled "Alignment with national policy on bio-

fuels with respect to the proposal: establishment of a canola bio-fuel industry as an economic anchor for accelerated agrarian transformation" suggests rhetorical adjustments to existing logics more than anything else. The language, the meaning-making processes in the Eastern Cape, which by this time were increasingly informed by national prerogatives, include, for example (Hobson 2006):

- A commitment to alleviating poverty and creating job opportunities through the development of the second economy.
- The availability of underutilised high potential arable land, calculated to be in the order of 500,000 hectares of which less than 50,000 is currently used for cropping purposes.

I will return to the second economy in later chapters. The second bullet point, however, points towards a policy artefact—emerging apparently from previous policy discussions but cemented through reproduction in the current policy—that has gained substantial notoriety in provincial networks. Its history and emergence in the provincial strategy document is of specific interest, as it reinforces my argument of both the expertise (and credibility of experts) and networks through which such policy knowledge emerges as being central to the policymaking process.

The calculation of the actual figure of 500,000 hectares has been difficult to trace on paper and members of the ECDALA pointed towards GIS studies undertaken in the past, which had reflected such a number. In an early meeting between Phyto*Energy* and the Eastern Cape Biofuels Task Team—part of the screening exercises and business plans around canola referred to by Felix Hobson above and indicative of the emergent network—there is some debate as to how much of the 500,000 was actually available. The half a million hectares is the total estimated land available according to the Department of Agriculture, however:

> [t]here is currently 50 000 hectares being cultivated. Of the remaining 450 000 approximately 100 000 hectares have been cultivated in the past. A probable land availability scenario given the socio-economic drivers in the region is: 150 000 hectares could be earmarked for maize production, 100 000 ha for soya, 100 000 ha for canola and 50 000 for other crops. The remaining 100 000 could be allocated to canola (Phyto*Energy* Development GmbH, 2006, p.3).

There is an element here of rudimentary or arbitrary land partitioning, and, while the provincial task team certainly had an idea about what the provincial policy was going

to look like, it had not been promulgated yet. Vested interests have shown an early influence and in many ways have begun to steer policy proposals that would still be forthcoming. The rudimentary partitioning of land seems especially premature, given somewhat questionable results from winter crop trials (of canola) that had preceded this meeting, whereas existing backlogs within the Department present another massive challenge. The minutes of the meeting further suggest:

> 1200 hectares of canola was planted in the [ECDALA] winter trial. To date results are varied with some yields expected to be around 2 tons per hectare and nothing in other areas. A key concern for the team was the sale of trial canola, which was expected to be harvested in October. In addition, the [ECDALA] needs R5m to fund a maize programme that was to follow the canola trial. This money has not been allocated and could jeopardize the project going forward. Storage of canola prior to transporting is an issue that was also raised (Phtyo*Energy* Development GmBH, 2006**)**.

In a country where any debate on land availability is bound to be contentious, one would expect that claims around future land use require some evidence to back them up. There was, for example, an unpublished study undertaken by the Öko-Institut that looked into a range of issues around sustainable biomass production in South Africa. In discussions with two researchers involved in this study, they were highly critical of the hyped-up availability of 500,000 hectares. One recommended that it was probably only a tenth of that number whilst the other suggested that even if it was not—there may well be 500,000 hectares available—to develop that amount of land would require associated services that are entirely unavailable. The important point here is how the 500,000 hectares has formed a recurring policy artefact that carries with it certain abstract qualities rendering complexity naught, legitimised more through repetition than reality. It also shows the importance of mobilising metaphors and what influence project managers and policymakers (who in the ECDALA are often the same people) have on each other, through the co-construction of such narratives. As one official of the ECDALA suggested, initially it was:

> *15,000 hectares of canola to produce biodiesel to export to Germany or to Europe. That was their claim to fame. … All of a sudden they saw that there was an interest in the province and they increased … [because] you can play with figures, they increased the plant capacity to equal that of 500,000 hectares of canola* (ECDALA official A, 2011).

Painting the Countryside Yellow: Mobilising Metaphors and Canola Trials (and Errors) in the Eastern Cape

While the need for a well-founded argument in policy is assumed but remains unmet in the Eastern Cape, there is an equal need to tread lightly on what is a highly political turf within the Eastern Cape. The latter was even recognised by members of Phyto*Energy*[10] who were weary of these inflated potentials and equally unrealistic objectives of developing them, but found themselves to be cogs in a bigger machine, which moved in ways out of their control. One respondent's self-criticism departs from written plans of Phyto*Energy*, many of which have coincided with political and government interests converging around the "half million". To provide some idea of this respondent's viewpoint, he was equally critical of the mandatory blending consultation meeting lamenting:

> *no one in that whole meeting mentioned uplifting farmers or mentoring or formation of coops* (PhytoEnergy representative A, 2012).

As a basis for the biofuels project, growing sufficient feedstock in the Eastern Cape should be considered the *sine qua non* of the Phyto*Energy* project. As one of their seven initial sub-projects, "Sub-project 3: Feedstock Development, Cultivation and Agrarian Supply", would focus on trials to ensure canola production (and an associated multi-cropping programme) would be feasible in the Eastern Cape. (KwaZulu-Natal and the Free State were also mooted as potential areas of supply; however, these would be in contravention of the licensing criteria stipulated by the DoE). Much of the criticism levelled towards the Phyto*Energy* project were their bold claims that they would be transforming 500,000 hectares of land in the Eastern Cape to canola production, amongst others. In an area with a history of problematic top-down and modernisation-based 'betterment' and 'rehabilitation' schemes (see Ferguson 1990, pp.260–64; e.g. Letsoalo & Rogerson 1982; McAllister 1992), such large-scale proposals were met with widespread suspicion (e.g Amigun *et al*. 2011). Nevertheless, at a practical level, one could ask why Phyto*Energy* would be making

[10] Meetings with Phyto*Energy* actually revealed a deep concern about the "land issue" and how the Eastern Cape could be developed most beneficially. Within Phyto*Energy* there were also differing perspectives as to what would be feasible although recent evidence from their website suggests a strict focus on sustainable agricultural practices (PhytoEnergy Group 2012). Whether these practices continue at the scale they plan to grow canola remains to be seen.

claims of 500,000 hectares, which not only defies logic but also contradicts the portions supposedly rationed out above.

The history of the Phyto*Energy* project is important to understanding the emerging narratives within the Eastern Cape Province. Although not as long and in-depth as Cradock's plans for sugar (see Appendix D and below), Phyto*Energy's* plans for canola were no less contrived and amenable as a basis for a powerful imaginary. Plans for canola, especially as a non-food crop resonated through the emerging network of interest, although mostly within the province but certainly with tendrils at the national level too. As early as 2005, Dr Michael Krummer of Phyto*Energy* approached KPMG to begin looking into the feasibility of establishing a canola-based bio-diesel plant in the Eastern Cape. At KPMG at the time, Wayne Jansen was brought on board with an associate, Charles Warren-Hansen. Together they would be the early project managers and establish the business plan for the project. As Warren-Jansen (2012, *Pers. Comm.*) described to me, they then set off to the Eastern Cape and met with Ken Burn of the ECDC. Ken Burn then introduced them to Felix Hobson and Leon Coetzee at the Department of Agriculture. As I had met with these same people on my field trips to the Eastern Cape to discuss the development of the Eastern Cape policy, it was very much a case of recurring networks.[11] It was through on-going discussions with these Eastern Cape officials that KPMG developed an integrated cropping programme for the province, with early aspirations of rotation cropping, "developing local farmers through a mentorship programme" and "creating jobs" (*ibid*). Although starting with good intentions, these plans became increasingly obscured through time, as the project became increasingly convoluted and new players entered into the picture.

It is useful to isolate two areas of development along which the canola project progressed (a supply or farm side and demand or factory side). Feedstock would be produced through an agricultural programme, with biofuels then produced at the 'refinery'—even if the latter was only a proposal at this stage. Through a close working relationship and the inputs of the officials at the ECDALA, the KPMG team

[11] My trip to the Eastern Cape was premised on snowballing techniques and drawing on different informants suggestions; hearing these names repetitively made me confident of their central importance.

pulled together a comprehensive business model incorporating a range of crops and providing estimates of costs and feasibility of production.[12] As part of the development of the model and interactions with the ECDALA, presentations were made regarding the proposals for an integrated cropping programme. Broadly, project proposals were made under the name of Project Saturn, an integrated cropping programme based on an 'end to end' financial model produced by KPMG. These ideas clearly resonated with Simpiwe Somdyala, who established Asgisa-EC seemingly based on the same plans as the KPMG shortly after. Asgisa-EC was established as an Agribusiness 'special purpose vehicle' in the Eastern Cape, which would build on earlier programmes such as the Massive Food Production Programme. At this stage, financial interests such as ABSA and the ECDC were also interested in the biofuels-based project, as were the original partnership of Ken Burn and Felix Hobson. The following extracts start to suggest the hype was mounting.

A report from South Africa info (Khumalo 2007) explains that:

> 'Felix Hobson, senior manager of the Eastern Cape government's agriculture resource planning and management division, said this week that the government had set aside R9.5-million for fencing land and planting canola and R8-million for planting sugar beet in the N2 Mbhashe local municipality to kick-start the project … one of the Eastern Cape's priority projects under the Accelerated and Shared Growth Initiative for South Africa (Asgi-SA)… 'The biofuel project is envisaged to be a major Asgi-SA project[13] in the Eastern Cape,' Hobson said, adding that it would create 'a huge market for agricultural products including canola, soya beans and sunflower which were not there before.' This would be achieved through establishing 500 000 hectares of currently under-used land for integrated rotational cropping within the next five years, Hobson said. European investors have reportedly expressed interest in developing the East London

[12] As this model and the associated original business proposals are under intellectual property rights, they were not available for further examination. An official of the DTI has remarked that this was the best-developed agribusiness plan assessed by the Department, suggesting it was a favourite to be supported.

[13] It is here where the artful naming of the Eastern Cape's 'Asgisa-EC' is best illustrated, as the projects in the Eastern Cape are in no way associated with the Presidency's ASGISA programme except in name. One cannot deny, however, that both would be legitimized by one or the other and if ASGISA actually continued as a programme there is little doubt that they would gladly take on the Eastern Cape projects as their own; especially they were to show signs of success. The NPC and New Growth Path have, however, subsumed ASGISA at national level, adding to the list of now defunct national plans. The naming and operations of Asgisa-EC have also encountered some controversy politically. In a 2010 budget speech, it is remarked that the provincial legislature resolved the issue of Asgisa-EC (Pty) Ltd as a subsidiary company with effect from 1 April 2010, with remarks stating that "most importantly, this development has resolved the issue of the legal status and public accountability of Asgisa-EC, a matter that has been a major concern of this house" (Songoni 2010).

> plant… 'This intervention will require an investment by government of R1.5-billion that will secure a simultaneous R3.82-billion foreign direct investment and a R7-billion investment from local financial institutions,' Hobson said. According to Hobson, the initiative would create around 23 000 new jobs and a sustainable R2.9-billion a year in agricultural production and processing in the province.

This is expressed almost verbatim on the ECDC website (and is still listed as one of their success stories despite no actual biofuels being produced):

> The Eastern Cape government has set aside R9.5-million for fencing land and planting canola, and R8-million for planting sugar beet in the Mbhashe area to kick-start the project. The biofuel project will create a huge new market for agricultural products, including canola, soya beans and sunflower. It involves establishing 500,000 hectares of now under-used land for integrated rotational cropping. These crops would be used to feed a proposed 200,000-ton-per-annum biodiesel plant in the East London Industrial Development Zone, as well as other biofuel and agro-processing initiatives. Linked to this project, ECDC is involved in setting up a number of SMMEs, which will assist farmers to access funding for the agri-equipment they need.

The interesting point, however, is that the original models produced by KPMG did not specify 500,000 hectares at all, or at least, it was an "end game", "something to work towards" not but it was hyped up. This was merely a number that became fashionable when additional players came on board, used as a selling point by the German interests especially. It is totally contrived, and, increasingly unlikely to be met in the near future. Politically, however, it is especially provocative and would match well with the plans of Asgisa-EC, especially if such proclamations would ostensibly improve their actually lacklustre record of accomplishment. Through Asgisa-EC, Project Saturn was renamed as the Biofuels Integrated Cropping Programme, who then continued to drive the KPMG business plan based on 500,000 hectares of dry land. An initial trial of 1000ha failed dismally according to four respondents from very different sectors. Unsuccessful projects were not something new to the province.

Schmeding (2009, p.19) describes the development of Asgisa-EC in terms of poorly performing programmes (i.e. the MFPP) prior to it being established and suggests that (see also Asgisa-EC 2009):

> Dragging rural developments by 2007 led to the understanding amongst political leadership of the Province that broader agrarian strategies and

> more diversification strategies were required[14]. Due to the brief existence of the programme, available literature is limited to the Five Year Business Plan. Asgisa-EC was formed and given the mandate to develop six pillars … Agriculture and agro-processing … Forestry development … Water resource development … Hydro-power and alternative energy … Tourism development … Addressing unsustainable human settlement patters in the province.

In response to the unexceptional development track record mentioned above (and how 'new' biofuels approaches may mean more of the same), reports of successes achieved by Massive Food Production Programmes (MFPP) emanating from *within* the ECDA (see Schmeding, 2009) need to be read in contrast to other independent works (Burgess 2011; Hajdu 2006; Jacobson 2013), which show a very different situation. Even Schmeding (2009) provides some useful caveats to canola production in the Eastern Cape, alluding to the need for developmental approaches to be considered before the technical aspects are. Clearly, one cannot assume that models represent reality and, given the structural and capacity deficits in the Eastern Cape, there is far less likelihood that production plans will succeed without significant development and training provided beforehand. Furthermore, if any argument is to be made about the benefit of the MFPP to food security, surely it will need to move beyond the relatively innocuous figures of hectares planted (as is the case at present). Food security relies on far more than food production, especially if that production adds no value to the livelihoods of the food insecure in the region. In the same way, biofuels production will mean very little and its potential left unharnessed, especially if it falls prey to 'new' rhetoric involving the same unsuccessful practices. If names are anything to go by, this unfortunately seems more than likely.

While the name suggests some resemblance to the nationally driven ASGISA initiative, it is in fact in no way linked to national levels institutionally,[15] other than

[14] This is characteristic 'government speak' in which policies take on (usually only in name) the form of 'integrated approaches' though little attention is given to how this works in practice. The Department of Provincial and Local Government have grappled with this very real problem through the implementation of the Intergovernmental Relations Framework Act (DPLG 2008). Drimie and Ruysenaar (2010) illustrate similar challenges in the implementation of the Integrated Food Security Strategy.

[15] Even the provincial growth plan does not recognize the national 'ASGISA' as an integrated development plan (Eastern Cape Office of the Premier 2008). It is not clear at all why the new funding agency even took on the name of ASGISA-EC for anything but convenience sake. Its utility can be seen in the way in which it is used by government officials, such as "the biofuel

building on national objectives. It also appears to be yet another reshuffling of organisational and institutional structures so common in South Africa's administration, and appears now to be merging with the Eastern Cape Rural Finance Corporation. Their glossy pamphlets also appear to exaggerate the success of their programmes, and very little actual evidence (other than spending) is provided. One also has to question whether any successes gained through Asgisa-EC would have accrued regardless of it being renamed as an entity, although that is not the focus of this research. (I will briefly return to the rural development discussion in the conclusion below).

Despite all these issues, reports from both Asgisa-EC and Phyto*Energy* still resort publically to faith in this land availability and the potential to cultivate it. The implications of this have since been extended into policies at national level, where canola production, despite limited success, has become a Key Action Process for the 2010/11-2012/13 Industrial Policy Action Plan (IPAP). The 'Production of biodiesel' is, for example, outlined in the IPAP as follows (Department of Trade and Industry 2010):

> Nature of the intervention: Providing finance (offset grant of €2million in 2009) to complete key studies to bring a 400,000 tons of biodiesel refinery project to a bankable business plan status.[16] The feasibility study has been completed. Lead department: DTI… Supporting departments / agencies: EDD and DOE / NEF and IDC.

The above is interesting first, as it shows how biofuels are re-entering the political and policy spectrum in areas beyond the provisions of the Biofuels Strategy but have become mobilising metaphors in the new realms of the bioeconomy and green jobs outlooks (e.g. Maia *et al*. 2011). As one official from the Task Team suggested to me, it came as quite a 'shock" when the canola project (which can only be the

project is envisaged to be a major ASGI-SA project in the Eastern Cape" (Hobson cited in Khumalo 2007).

[16] This figure itself seems overly ambitious. If one takes an optimistic yield of two metric tonnes per hectare total yield (e.g. Department of Agriculture, Forestry and Fisheries, 2010, p.3) and therefore one tonne of oil per hectare (high yield varieties could produce 1.5 tonnes per hectare). To produce 400,000 tonnes you would need the upwards of 1.2million hectares on a three year rotation. Given that only 500,000 hectares is available (and supposedly being farmed in rotation with other crops) there is a significant shortfall. South Africa only produces 350,000 tonnes of canola oil per year (*ibid.* p.15), so this plant would require more than the entire annual production.

Phyto*Energy* project) was so central to the IPAP,[17] especially compared to the other biofuels projects that are "on the cards". "We hadn't even been thinking about it". The Department of Trade and Industry does, however, have a close connection to the Phyto*Energy* project, and would of course be interested in seeing it come to fruition. They have already provided close to €2million in support for the project (provided through offset funding from the highly controversial arms deal according to internal DTI documents), even though it has not been spent in ways they would prefer. This takes us to the second area in which the canola Project of Phyto*Energy* finds itself within a close interplay with government; the refinery side.

For a country that has had so much hype steeped towards its potential ability to produce biofuels, and a proliferation of proposed refineries, the actual establishment of any such refineries has been lacklustre in South Africa, and Phyto*Energy* have been no stranger to continual delays. As it is not central to the thesis, I will not extend on the details. It is, however, worth noting that even with massive support from the DTI, Phyto*Energy* have squandered time and money in first trying to establish a refinery in the East London industrial development zone, which, when turned down for unclear reasons, then moved to Port Elizabeth. This relocation adds an extra 300km to any logistics, no small addition when transporting feedstock across very testing landscapes, while also making a range of costly feasibility studies null and void. Internal documents of the DTI, for example, suggest major challenges with the financial arrangements in the proposal stages of the project and limited reports of successful planting, yet the underlying narrative is the currency through which policy rhetoric is traded. As an informant involved in drafting provincial renewable energy strategies suggested:

> *But then, one of the other things we have is an interest in the biofuels. We have the big PhytoEnergy project, a biodiesel project. So the province started seeing that we are doing this so they gave me budget to develop the energy strategy and we are rolling that out now (*Independent consultant, EL-IDZ, 2010).

[17] It is also worth pointing out that no mention is made of the two ethanol based projects, which are playing a far more central role in the policy development although are not funded by the DTI.

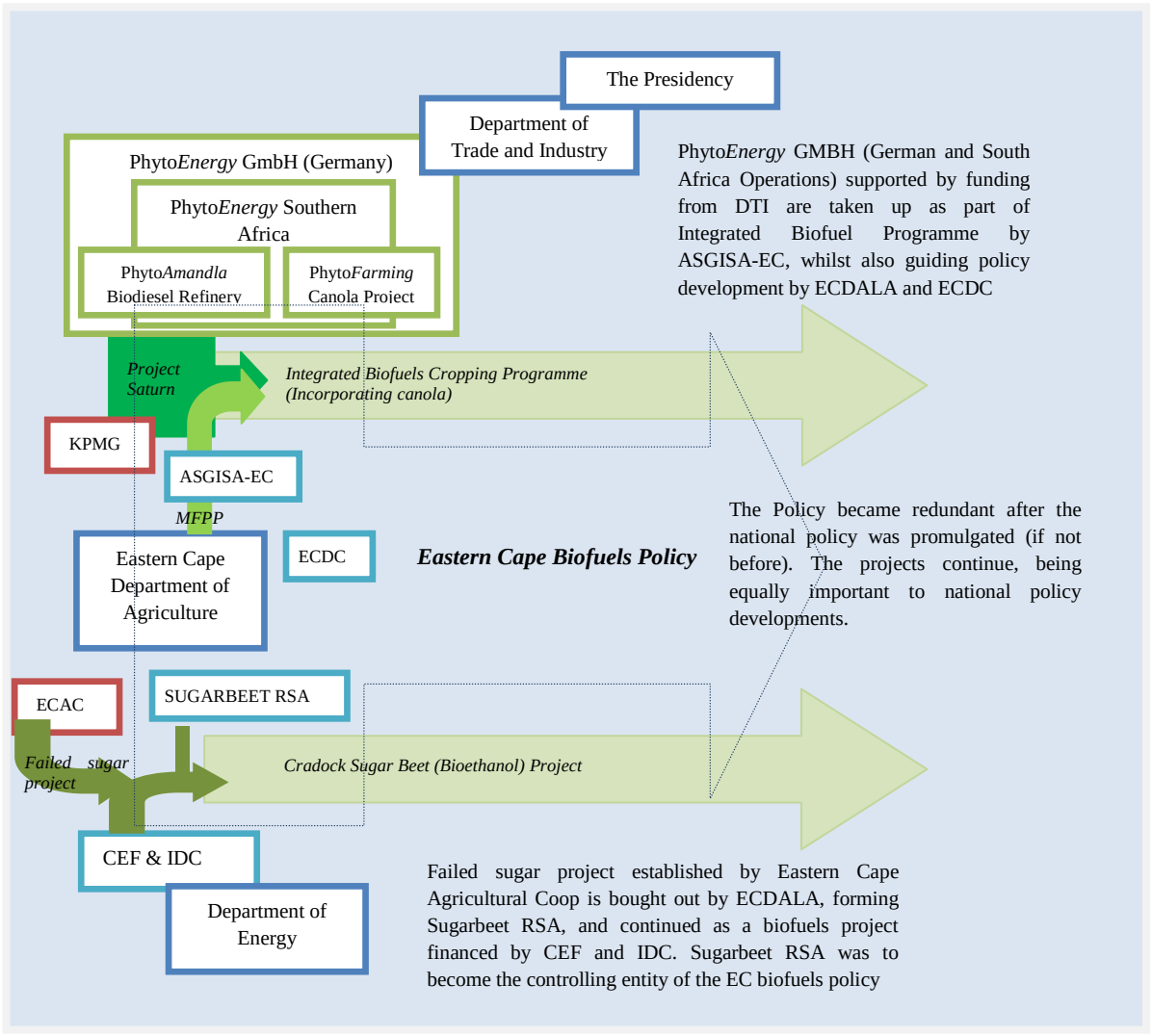


Figure 6: Influences and streams in the Eastern Cape's policy process

This brief excursion into the dynamics of the actual development of the Phyto*Energy* project again reveals a situation dominated by important interfaces between "policymakers" and policy entrepreneurs and the narratives they share. However, issues such as those described have created tensions in the wider support of the Phyto*Energy* project and led to doubts by original supporters within the government. Even members of the IDC, the theoretical industrial champions for biofuels, have been critical of the proposed biodiesel project. Again, there are questions of the reality of rural restructuring that is achievable, at least when driven by agro-industrial imaginaries that dominated the biofuels proposals. The "reality" in the Eastern Cape is complex, multi-faceted and well-beyond the models describing input and output costs as a matter of course. Trials in the Eastern Cape seem to suggest exactly this,

meanwhile, narratives continue and governments overwhelming logic is one of continual support and certain success. It is not the point of this thesis to argue these are wrong or right. That they have driven planning around biofuels in the Eastern Cape is far more important. So too is that these narratives have been fashioned by close networks of similar mindsets.

CRADOCK'S BITTERSWEET SUCCESS?

Cradock is a politically significant town in South Africa. Its history is one in which four members of the ANC were abducted and later killed in 1985. It is also a biofuels 'hotspot'. There is specific mention of Cradock in the biofuels policy proposals of the Eastern Cape. The links are clear in that Roake Crew, the general manager of Sugar Beet RSA—the original proponents of the Cradock sugar beet 'sugar' proposals—originally worked at the Eastern Cape Department of Agriculture. When the provincial biofuels strategy was being developed, Sugar Beet RSA was (and remains) wholly owned by the Eastern Cape Department of Agriculture. This institutional linkage made Sugar Beet RSA an immediate candidate to be the 'umbrella agency' for biofuels. As the 'draft' provincial strategy suggests (Anon 2007, p.9):

> This body could be Sugar Beet RSA (Pty) Ltd which is one hundred per cent government owned, has a Board of Directors appointed by the MEC for Agriculture and Chaired by Mr. Sipho Pityana, is already operational and active in the bio-fuels industry, has an ownership and development model for the sugar beet industry which will promote employment equity, BEE in respect of ownership of the processing facility and support industries, part ownership of the facility by raw material suppliers, the development of up and coming producers of raw material and the establishment of commercial black farmers through land redistribution.

The political support for the Cradock Project has, however, waxed and waned in the Eastern Cape. While Asgisa-EC could see great potential in a 500,000 hectare biofuels haven (see above), the original plans of the Cradock plant had very little to do with anywhere (or anyone) other than Cradock (i.e. it was to be a localised project with nowhere near the political leverage something like canola throughout the Eastern Cape would garner). Of more interest to this thesis, is that Cradock was engaged in a different network as Phyto*Energy*, or at least, the network coalescing around the Cradock project was constituted by interests that stretched to the national

level in important ways. It would thus become embedded (somewhat luckily) within national policymaking, far more than the canola project.

I have provided an extended background to the Cradock case study in Appendix D but to recapitulate, the current sugar beet-to-ethanol project (which is actually for the time being a grain sorghum-based project) was proposed after an unsuccessful attempt at marketing sugar from sugar beet. Originally conceived, the project was established by the Eastern Cape Agricultural Cooperative (ECAC), as a new crop for the Fish River irrigation system. The original plans for sugar were not viable and thus the project collapsed. It was then revived as a bioethanol project. Major players (see Figure 6) involved in the project included the Eastern Cape Department of Agriculture (who bought out the ECAC), CEF and the IDC (see description above), some private investors—who have since pulled out of the project— and PGBI who were contracted as project managers and later dismissed. The IDC has since taken over as the dominant shareholder. The path followed has not gone smoothly and it has been hampered with continual delays. According to recent news reports (and my own interviews in the field) the project remains shrouded in secrecy, with increasing tensions in the community and facing host of challenges in the new land reform scheme that has been proposed for the project. This mentor-based land reform programme has been led through increasing support from the national Department of Rural Development and Land Affairs and presents its own challenges for policymaking in South Africa, not least of which is the direction the biofuels policy may end up taking in the future. Nevertheless, the potential benefits through land reform have been a useful selling point for the project and highlights a recent but fortuitous shift in political support. (Gugile Nkwinti, the MEC for Agriculture in Eastern Cape from 2005-2009, has been an early supporter of the Cradock project and was moved to the national Department of Rural Development and Land Reform; he appears to be continuing the support from this new position.) What is of most concern in this chapter, however, is the role Cradock has played in the early formation of the biofuels strategy, not only at provincial level but also at a national level.

Securing a Market and Policy in Action

When PGBI took over the project management of the Cradock bioethanol project (essentially from the Bankability Phases) there were two main activities proposed, both being corollaries of creating a market. The first would be to establish off-take agreements with the existing petrol companies (see Appendix E). In this process, the PGBI encountered challenges much the same that the policymakers at national level have encountered; the petrol industry in South Africa was, to large extent, not in support of a biofuels industry and government has been especially hesitant to coerce them. Although formerly not 'against' the idea of a biofuels industry (SAPIA 2009), informally South African Petroleum Industry Association (SAPIA) has been in quiet opposition to biofuels. (Members of the national Biofuels Task Team were adamant that SAPIA and individual fuel companies were actually strongly opposed to introducing biofuels, which the experiences of PGBI not being able to secure off-take agreements with fuel companies seem to confirm.) In the early stages of the project proposal, lengthy consultation between the fuel companies and the PGBI had lead to some off-take arrangements being concluded although this only amounted to roughly fifty per cent of the proposed ethanol production from Cradock.[18] Despite securing at least some off-take, at this point the IDC dismissed the PGBI as project managers (although not for reasons relating to limited success in securing off-take).

The second, which appears to be the only way the first will work (given that only fifty per cent of off-take was secured), is to assist in promulgating legislation that specifies a blending mandate (although this was neither the job of PGBI nor the Cradock project alone). This would ultimately force major refiners to blend biofuels and in effect secure a market for biofuels producers.[19] This process was still in

[18] Interestingly, the Central Energy Fund, which owns Petro-SA (South Africa's national oil company that, according to their website, pride themselves on producing high-quality eco-friendly products (PetroSA 2012)) also struggled to secure adequate off-take even though they own the refinery. Clearly, there are competing and contrasting interests here. It is perhaps worth adding that ARDA (formerly Sugar Beet RSA) has also suggested that blending will be handled by a new refinery being built at Coega, despite continued delays by government in deciding whether it will go ahead (National Planning Commission 2011c) and numerous logical reasons why it probably should not (Wakeford 2012).

[19] Although ambiguous in its first draft, the draft mandatory blending requirements released in 2011 include sourcing biofuels domestically and thus ensure uptake for local producers. The draft regulations specify, for example, that "a licensee may only purchase biofuels from a licensed manufacturer of biofuels in the Republic" (Department of Energy 2011b, p.6). Being only five

consultation (in 2012), however, with recent draft legislation on clean fuel specifications, it appears that oil companies may have to shift their support towards biofuels. Ethanol is an effective octane enhancer, which the fuel companies will require to adhere to these new clean fuel standards.[20]

Two areas of importance need to be outlined from the above. On the one hand, there is a clear link forged between the IDC and the Biofuels Task Team by the need for promulgated mandatory blending (to ensure the project has a market). This is the dynamics at the policy level and the specific area of interest to my thesis. Another level, which remains one of importance but apparently all together ignored in current policy frameworks, is governance at the project level. The dismissal of PGBI and discussions with a few stakeholders has raised concerns about governance and due diligence processes at the project level. Here the IDC, as a majority shareholder has been "calling the shots" according to one insider, although there is uncertainty as to whether those shots have been "by the book".[21] I shall not indulge the latter any further at this stage, as it is contentious and would be conjecture. I shall, however, indulge the policy aspects.

According to an employee of ARDA (the new name of Sugar Beet RSA),[22] in the bigger picture, the Cradock project was a relative unknown until the IDC, along with some Brazilian representatives, visited the project and showed some interest.

---

pages of extremely thin details, no discussion is made of what happens when there is not sufficient feedstock within the country and whether importing fuel will then be allowed. Importantly, there is a clear indication that these draft mandatory regulations are very much biased towards securing the markets for (forthcoming) producers rather than detailing the full implications and processes, which such blending will incur.

[20] At least this is the view taken by Sugar Beet RSA and some of the other biofuels producers. Interviews with SAPIA have actually suggested that ethanol is not the only solution to meeting clean fuel standards *per se*, and is certainly not as definite as some of the biofuels producers are considering (SAPIA interview, 2010). While being contentious in current deliberations, what is more important is how mandatory blending and indeed early proposals for biofuels were based on the needs for a market, not just of Cradock but also of the entire biofuels imaginary.

[21] As one respondent suggested, when the IDC through Noel Kamraj provided all the seed monies for the joint venture, obtaining approximately 46% [unsubstantiated as yet], they became the major rather than majority shareholder. The IDC bankrolled the project while CEF and Sugar Beet RSA were still sourcing funds. Eventually the IDC said "pay your money or leave and CEF got chucked out". The agreement apparently also puts the Department (who funds Sugar Beet RSA) at risk, as they are still part of the agreement and liable for expenses owed.

[22] ARDA has been described as the new name of Sugar Beet RSA (Somlotha 2011) and as a co-operation agreement between the IDC, the CEF and SBRSA, now known as ARDA (Sonjica 2013).

Without the right legislation, the project would fail in much the same way its predecessor did. However, the relationships required to achieve this would be challenging at two levels. First, Sugar Beet RSA would have to continually work on maintaining political support at the provincial level (even being wholly owned by the ECDALA their funding was subject to political discretion), while the IDC working in partnership with CEF would do the same at the national level within the Biofuels Task Team (and with international players too).

When it comes to the project-policy interface at provincial level, there is, for example, an interesting contradiction emanating from an interview with a main member of Sugar Beet RSA. On the one hand, he suggests that what they have been doing is "lying low" and hoping they manage to "stay of the radar long enough to get some real work done" (SBRSA Member A, 2011). The meaning here being that when new politicians enter the picture they are able to decide on the fate of projects without much effort or understanding. Certainly, perceptions in Sugar Beet RSA were that that the minister—Ms Zoleka Capa—taking over from Mr Nkwinti, was less supportive of the mentoring programme that was proposed for the project, however, has (finally) expressed that the farming operations of the core estate will be managed by the Department (Capa 2012). Similarly, this member of SBRSA was critical of how the current biofuels policy confuses the role of government and that government tries to do too much rather than allowing business to play its own role. He suggests:

> *If they [business] want to support a processing facility in Coega, let them, as long as they meet the environmental requirements and stuff, let [them]. [The project] has to find a market for [its] product, not [government]. [The project] has to find investment money, not [government]. And [the project] has to find [its] raw material, not [government]* (SBRSA Member A, 2011).

By this though, he does not dispute the role of government entirely, rather he suggests:

> *[Government] have to be looking at making [the project] profitable and to make [it] profitable you need to look at the piece of ground in front of you and say what can I do that's to the benefit of the owner of that ground* (SBRSA Member A, 2011).

In essence, as long as government facilitates the project, as the project manager's conceive it, there is no problem. (On the one hand, government needs to step back and let businesses do what they do best, but at the same time, government needs to make them profitable). The contradiction, however, is that staying 'off the radar' is exactly the opposite of what Sugar Beet RSA (and the IDC) has done. Or rather, they have attempted to surface on certain radars and not others. That is, they have looked for support in different networks within 'government', but have succumbed to challenges in which the 'government' has looked at the land in front of it and decided it may actually wish to do different things. The problem here also being that while the 'government' might be considered as a single, rational actor[23] (guided by policy) it is equally "an array of disconnected specialisations and an arena of rivalry" (Colebatch 2009a). While Sugar Beet RSA has certainly informed and been prioritised within the early provincial biofuels policy proposals, support has not been ubiquitous or continuous. Nevertheless, the important point is that they have initially played a central role at provincial level, through close alliances with the Department of Agriculture, who at the time had a very similar perspective of how biofuels were to be pursued. (Little wonder that bioenergy projects and proposals do not seem to have garnered any support in the province.)

Government and its policymaking apparatus is not one monolithic entity but is also comprised of multiple interests, internal networks and pathways (including political gatekeepers and parallel lines of authority) through which policy 'happens' and decisions are made. A major challenge in trying to examine and identify these is that they are dynamic and change with time. Sugar Beet RSA and the IDC are then one of many projects and vested interests, the influence and support of which is equally unstable and fluctuating. Yet such a situation needs to be problematised in connection with early national processes too; processes that the Cradock project had an apparently significant and yet partially redundant influence (considering decisions taken have not gone in their favour in the short term).

[23] For example, as Stone (1988) highlights in terms of the 'rationality project', the governmental process could be considered as the systematic pursuit of articulated ends through 'policy' (Colebatch 2009b).

The Bankability Study for the alternative sugar mill and the Prefeasibility Study for the ethanol plant highlight the prevailing barrier to bioethanol (and sugar) production in Cradock is a lack of any markets for the final products. Reflecting on Roake's response above, the issue is that the way the project has found a market is *through* rather than *separate to* government. The ability to do so comes through the IDC and, at that stage, the CEF, being willing to take a more active role in creating that market. It is here where the most identifiable connection to policy is found but neither policy, nor practice quite reflects the other but are perhaps better considered a function of co-production or 'co-evolution' when regarding policymaking as a complex adaptive system (Sumner & Tiwari 2009). That is, there is a complex inter-working between the two, from which policy emerges. The crucial link, however, is the IDC. Its plans both before government promulgated the final national Strategy and in the continuing negotiations around mandatory blending mentioned above.

Other potential players in the biofuels industry, the sugar industry for example, were not particularly interested in supporting any biofuels development until they had been given clear indications of what the policy was going to say. (Investors were looking for surety or rather waiting to see if government would make money available rather than putting money upfront themselves; its 'good business'.) The IDC and CEF (and a few other key players – see next Chapter) were weary of this and through their networks took a more proactive approach. As one interviewee suggested:

> *So the IDC said what do you think the policy should be? So we had lots of discussions. The IDC, sent [these] back into [the] parliamentary committee unbeknown to us, and, [when] the policy came out, we looked at it and said this is what we gave the IDC* (Consultant F, 2012).

Others have been more upfront (in fact quite proud) that the IDC and CEF took over the drafting of the National Strategy. One respondent from the IDC reflected:

> *Let me tell you about Noel. He is very passionate about this project… He will tell you "I contributed to that strategy, I wrote that strategy", which is true!* (IDC official A, 2012).

Others from ARDA agreed:

[Interviewer] There has been some suggestion that the IDC and CEF wrote the strategy that was passed through the BTT.

[Respondent] *Well that's because they did, and Noel was especially passionate about Cradock by that stage.* (SBRSA Member C, 2011)

Such quotes suggest that the IDC and their partnership with CEF had far greater influence over proceedings within the BTT than I had originally expected. (I later came across internal documents from the CEF suggesting it was their role to sort out the policy – described in the next chapter). This does, however, need to be contrasted with the empirical narrative of the following chapters that indicate far more influences than just those around Cradock (and a more nuanced affair between the IDC, CEF and Biofuels Task Team). The important point is that through the requirements of its Cradock project, the IDC was calling for very similar policy criteria as the other projects and had access to the BTT, allowing it to be a far more influential policy 'entrepreneur'. This should not be considered a one sided affair, however, as both the above respondents and others have suggested. A former Director General involved in the BTT processes before the release of the *final* Strategy suggested in an interview, for example:

[Interviewer] Yes, from the Task Team members I have spoken to it seems like there was a number of these debates [interest-based debates emanating from particular departments, such as Water Affairs arguing there is insufficient water available] it would have been nice to be the fly on the wall.

[Respondent] *Correct, and the Department of Science and Technology's main interest was more in the energy crops that were not food crops, the second generation, like algae etc., which for the other people it wasn't about that, it was about the sugar beets, the stuff, the crops that are being grown today.*

[Interviewer] With mentioning sugar beet, the projects that are on the go at the time of the strategy, well the proposed projects, what kind of influence do existing proposals around biofuels projects have on policy, is there a direct link or is the Task Team autonomous in steering the policy.

[Respondent] *Well, whatever we do in policy has to have a semblance of reality and that reality is brought to bear by people with experience and things. For instance the sugar beet things that were going on in [Eastern Cape], pilots or whatever, yes that had a direct influence on policy, for instance even with maize, they use maize, we are growing in the country ... we have so much excess with price volatility etc. etc. ... it was based on practical information.*(Former BTT Chairperson C, 2011).

Furthermore, biofuels as a new development option resonated with existing or emerging government interests and this was not only recognised by policy-makers (who would draw on such themes as supporting their strategy) but by project managers and proponents.

> *"At the same time government policy on the green economy and carbon footprint and all this kind of thing was becoming the buzz word so [the Cradock project's shift to ethanol] slotted in perfectly with the government's strategy of renewable fuels and green revolution."*[24] (ECDALA Official A, 2011)

CONCLUSION

This chapter has provided some background to the types of biofuels projects in Africa, Southern Africa and South Africa. Whereas potential exists for benefits to accrue within the rural economy, this does not automatically translate into rural development and there are different approaches that can be taken. Each type involves tradeoffs, and these need to be accommodated by policymakers. However, there is also the situation in which existing projects have far more influence on policymaking and the direction policymakers move towards, which also has to be considered. It is this latter point that the bulk of this chapter has focussed on.

The importance of such an emphasis—that policy and projects co-evolve—informs wider debates about betterment planning in the Eastern Cape. While there has been much critique of the plans that have been made, there is little emphasis on how such

[24] It is for the above reason that, the respondent suggested the Department of Agriculture, through the Eastern Cape Rural Financing Corporation, bought 100% in Sugar Beet RSA.

planning actually occurs. Although biofuels present new potentials, the rationales of 'development' have remained very similar, and, as I have illustrated, a large part of the reason why has to do with the project-policy interface being so porous. So too are the networks involved in such planning and the information flowing within them. The assumption of 500,000 hectares of available land is a case in point. This land has always been 'available' but that makes it neither 'vacant', nor 'open to development' though that part of the story is excluded from the narrative. Therefore, while I have suggested an agreement with others that betterment planning may be problematic in its logic, there is far more need to think not about the content of the planning but who and how such planning occurs.

Similarly, if one looks at projects judged to be of most benefit to existing rural political economies of small-scale agriculture in Africa—that the Eastern Cape resembles closely—the South African proposals depart from these with an overwhelming focus on larger-scale agro-industrial projects. Such approaches to agricultural reform are likely to reinforce an existing 'duality' in South African agriculture (Van Zyl *et al.* 2001; Hall, 2009), which has limited benefits for small-scale farmers, whilst also substituting capital for labour. Such approaches are unlikely to achieve the explicit development objectives proposed by the Strategy in the first place but show the inertia that these modes of production have maintained through the policy's development. The challenge is that, if we are to subscribe to the allegory of the dichotomous 'second' economy, complexity is a given but strategies are not built on complexity and rather work towards its simplification. In the new so-called biofuels hotspot of the Eastern Cape, for example, a long historical failure of industrial farming should itself be a major indicator that entirely different approaches need to be taken (GRAIN 2008; Mayet 2008; Sugrue & Douthwaite 2007; Cf. Ferguson 1990, Burgess 2011).

Importantly, during the provincial policy's development, there was limited potential to include diverse or novel perspectives, although there was nonetheless some political disagreement. A dominant issue in the Province was the food-versus-fuel debate, although within the Eastern Cape this was more of an internal squabble (the policy was never made public). According to internal communications between the

ECDALA and other government representatives, the views expressed by the *ad hoc* task team represent a similar approach as the 'economistic' perspective I will describe in later chapters. That is, biofuels presents a new, untapped market for producers, and by allowing them to earn money, it provides greater food security. The logic is not entirely incorrect—it makes sense—but it also neglects contextual issues. At the very least, agricultural development already faces a number of institutional and capacity challenges, especially in more remote areas like the Eastern Cape (see Greenberg, 2010), so it is unclear how this would improve in the case of biofuels. The provincial Department of Agriculture appears, however, to maintain a 'Green Revolution' culture and when programmes fail, it is ascribed to lack of technical expertise or training, capacity, or the market, rather than perhaps being incompatible from the outset. A recent edition in a string of such programmes is the Massive Food Production Programme, which has been critically assessed and described more as a disappointment (GRAIN, 2008; Nilsson & Karlsson, 2008; African Centre for Biosafety, 2008). The latest approach in the Eastern Cape—the Integrated Cropping and Biofuel Development Programme—takes a more specific biofuels focus. No available impact assessments were available at the time of writing, however, in addition to existing challenges, complicated land tenure issues are likely to arise as much of the land is traditional or communal land, providing at least some important livelihood assets for locals (Hajdu, 2006; Mayet, 2008). Large-scale agriculture in these areas is likely to create indentured labour and introduce/exacerbate inequalities between farm owners or local elites and those already living in poverty, more than empowering local citizens. Furthermore, for industrial biofuels production, producers are unlikely to sign off-take agreements and rely on small-scale farmers so they may be marginalised in a concentrated agro-industrial chain (Cf. Maxwell and Slater 2003).

The importance of the above discussion will be raised again in later critiques of the biofuels policy's objectives of rural development, but also serves as a precursor or initial illustration to the way such projects and their proponents have informed the biofuels policy's trajectory, rather than awaiting or reacting to policy outcomes as is often claimed or assumed to be the case. The dynamics are, of course, far more complex. For one, there have been doubts raised as to whether or not an enabling

institutional environment to support biofuels exists in many developing countries (Kojima & Johnson 2005) but is this relationship so simple and static? Implementation is inscribed within prevailing local operational paradigms and counterpart global commodity chains while existing practices (whether real or hypothetical) have an important bearing on policy development. To interrogate this idea of complexity further, the Eastern Cape provincial strategy serves as an example in which there have been mutual interests shared between project managers (the Phyto*Energy* project and Sugar Beet RSA) and policymakers. These networks have (re)fashioned local narratives, though remain quite abstract, and legitimised 'new' government programmes in place of old ones, although actual processes and underlying rationales have remained very similar; only the numbers have changed. It is here that discourses of development are important and remain distorted in the Eastern Cape; that these so easily merge with international biofuels narrative only reinforces or accentuates the distortion. Though, according to Foucault, power is everywhere and can take the form of resistance and change as much as it can of oppression, it appears that in the Eastern Cape any such resistance has not been sufficient to redirect what appears to be hegemonic prescriptions of 'the way things need to happen'.

Brushing much of these intricacies aside, at the provincial level the policy has been eclipsed by national processes. By this, canola and biodiesel have been somewhat sidelined, or at least were so during the national strategy's development (see next chapter). The same is not true, however, of bioethanol and the Cradock project. Although they have had as many delays over the past few years, they have had an insider track within the national policy's development. That the policy turned its back on these players is important, but perhaps only temporary. This controversial trajectory in the development of the strategy is the focus for the next three chapters and then taken up as a discussion in the final concluding chapter.

CHAPTER 5: THE BIOFUELS INDUSTRIAL STRATEGY OF SOUTH AFRICA - AN EMPIRICAL NARRATIVE OF ITS GENESIS

In the introductory chapter, it was mentioned that policies are developed in the face of existing operations and institutional configurations in government. Furthermore, Walker *et al*. (2009), highlights biofuels as one of the global-scale challenges that are outpacing the development of institutions to deal with them and their many interactive effects (see also Lima and Gupta, 2013). The speed at which the establishment of biofuels schemes takes place can be particularly damaging to the poor (Clancy 2008), so interrogating the development of such 'enabling frameworks' becomes important and an on-going concern. As Mosse (2004, p.664) further suggests 'policy is part of the context of action', but not the start of it, as is often assumed. Rather, policy is part of a wider political-institutional process of action and more often than not follows or represents practice, rather than precedes or guides it (Mosse, 2004; see Chapter 4). Much of the intent of this thesis is describing this context of action. In the first section of this chapter, I extend on the idea of what I call a 'normalised' synopsis of the biofuels policy in the introductory chapter. This is the summary provided by existing reviews of the South African strategy. At its most succinct, the decision emanates from Cabinet in 2005, a *draft* Strategy is released in 2006 and the final Strategy, which excludes maize and *jatropha*, is promulgated in 2007, much to the dismay of the biofuels industry. A far more complex story of policy-making processes in South Africa, challenges this extreme simplification of events, which is the focus of the remaining empirical chapters.[1] Although a useful starting point, the Cabinet's decision even to pursue biofuels in 2005 was far 'messier' than has been considered within existing reviews, and that too was the tip of the proverbial iceberg.

[1] In much the same way Dvora Yanow (1996) provides what she calls a realist tale—a seemingly objective, historical account of the development of legislation that created the Israel Corporation of Community Centers (IIICC)—I consider my extension on the simplified annotation of events in the development of the biofuels policy as a similar kind or reproductive historical narration. I do acknowledge, however, that this historical reproduction is authored and will include biases and interpretations of my own.

The decision-making process has also occurred within a wider context of commercial-farmer lobbying, private interests and what Zahariadis (1999; see also Kingdon, 1984) would consider to be multiple policy streams. The previous chapter has already outlined a project stream at provincial level and its relationship to both provincial and national policymaking. In this chapter, I continue the discussion looking at the national level. Within government, an assortment of officials both political and administrative—or what Masters (2012) calls the centre of manifold 'concentric circles' in policy decision-making—became involved. (The outer circles of her model encompass non-governmental organisations, civil society and the media but the importance of Masters' work is working towards an understanding of 'agency' and who is able to influence the decisions made in South Africa.) Where the biofuels policy differs from her study of foreign affairs is in the arbitrary boundaries that occur between such 'circles' and it is networks that allow these groups to transcend such boundaries to certain degrees, and equally have varying spheres of influence or, simply put, power within them (as Masters herself acknowledges).

It has also been discussed that policies cannot be taken simply at face value and biofuels policies are no exception, if not in immediate need of greater scrutiny. The challenge is made all the more acute in South Africa, which is known for good policies but poor implementation (Freund 2010; Khosa 2003; Chapter 3). What such a dilemma means for realising the proposed benefits of biofuels is a critical concern but so too is the need to pry open the value-laden term 'good policy'. The broad direction of the enquiry has already been described in the methodology, in which the policy process becomes an issue to be problematised. Following from Foucault, problematisation in this sense is both a "kind of general historical and social situation—saturated with power relations…imbued with relational play of true and false…as well as the nexus of solutions to that situation" (Rabinow, 2005, 139). The primary task of the analyst is not to "proceed directly toward intervention and repair of the situations discordance but rather to understand and to put forth a diagnosis of what makes these responses simultaneously possible" (*ibid.*, 138). In other words, it is about questioning the *status quo* such that "what is understood to be normal becomes problematic" (Colebatch & Gill 2006, p.255). As a central theme of the thesis and an explicit aspiration of the strategy (one based on many implicit

assumptions), I again flag the issue of rural development and the caricatured outline of the process, only in anticipation of more detailed discussion later. For now, it is important to provide a synopsis of the Strategy itself, which in effect is to provide the brief sketching of the situation of discordance I am aiming for here. I will then begin the empirical narrative of the national Strategy.

THE SOUTH AFRICAN BIOFUELS POLICY IN PERSPECTIVE – A BRIEF SYNOPSIS OF THE POLICY'S DEVELOPMENT

Although some authors (e.g. Jumbe *et al*. 2009) commended the South African government on promulgating a policy, when other African countries had failed to do so, others (both popular and academic) in South Africa have not shown similar optimism. The difference of opinion varies between sectors or ideological preferences; civil society groups, for example, have dismissed the biofuels policy as agribusiness propaganda writ large and doomed to fail the poor and vulnerable (African Centre for Biosafety 2008). Others have criticised the rigour of the process. As the *draft* Strategy states that a consultation phase was supposed to finalise the *draft* Strategy, many felt another phase of consultations would occur before finalising the final Strategy; it never happened casting an early doubt on the process. Others were critical of its potential to establish an industry (Makanete & Kupka 2007; South African Biofuels Association 2007). The exclusion of maize and *jatropha* as feedstock in the *final* Strategy also received critical appraisal. The maize fraternity[2] especially resented the restriction as they were relying on a lucrative ethanol market to stabilise their markets.

It should therefore be seen that, despite some enthusiasm, the South African policy is highly problematic. It should also be recognised that even the more in-depth reviews tend to challenge the content of the strategy, rather than dissecting and analysing its formative period. One also needs to reflect on the historical context when trying to understand the policy's development. Any focus on ethanol for fuel during apartheid,

[2] Maize farmers (represented as Grain Alcohol Investments) invested R24million with Sterling Waterford (through Ethanol Africa) providing another R408million (African Centre for Biosafety, 2008). Construction was halted after maize was excluded, taking a 'wait and see' approach. Now it appears that they are pursuing sorghum as a feedstock (see Mabele Project in Table 3).

for example, would have been eclipsed by alternative synthetic fuels derived from coal and gas (Blanchard *et al.* 2011; see Appendix E), which still provide up to 35 per cent of South Africa's transport fuel supply. This makes support for biofuels less important in energy-security terms than it would in other countries (Pradhan and Ruysenaar, *forthcoming*). There has also been state supported research into biodiesel since the late 90s, however, as one National Department of Agriculture official has lamented, "*back then it was not sexy to be doing biofuels*", and largely this research was not considered sufficient to catalyse a policy process around biofuels. The on-farm production of biofuels, essentially biodiesel for on-farm machinery, has also had some attention but remains financially unviable according to recent studies (KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development 2010).

What changes this relatively bleak outlook on biofuels I shall discuss later but the early history is also reflected by a range of laws directed towards the use of biofuels, especially as part of a wider renewable energy target proposed in the Renewable Energy White Paper (2003). Even though it was in 2007 that the Department of Minerals and Energy (DME) and the Cabinet promulgated the final Industrial Biofuels Strategy, the formal policy process was set in motion much earlier and has been directed within a wider political and legal context. A wide arrangement of policies and research programmes predating and guiding the formal development are provided in Table 3, which highlight subtle and sometimes drastic shifts in the preference towards biofuels and renewable energy.

Table 3: Major events and technical details of the BISSA (information here is gathered from the following sources, amongst others; Wilson & McDaid (2007); African Centre for Biosafety (2008); Haywood *et al.* (2009).

Relevant policies and Milestones	Date
The Conservation of Agricultural Resources Act (Act No 43 of 1983 as amended): *Jatropha* rejected as a feedstock in the *final* Strategy due to concerns of its invasive potential within the country, which this Act oversees.	1983
The Constitution of the Republic of South Africa (Act No 108 of 1996): Government must establish a national energy policy to ensure that national energy resources are adequately tapped and delivered to cater for the needs of the nation; including access by the poor.	1996

White Paper on Energy: Sets out the national energy policy with alternative fuels and a diversified energy supply mix acknowledged.	1998
White Paper on the Promotion of Renewable Energy and Clean Energy. Part one: Promotion of Renewable Energy Essentially a forerunner (verbatim copy) of the later White Paper on Renewable Energy (2003). Also highlights the need for a Clean Energy Strategy, which is fulfilled by the Integrated Clean Household Energy Strategy (2004)	August 2002
Integrated Energy Plan: Highlights the need to expand coal- and gas-to-liquid transport fuels (synfuels) and introduce policy, legislation and regulation for the promotion of renewable energy. The plan is devoid of any mention of biofuels; however, biomass energy is highlighted as an important renewable energy source in terms of fuel wood. Biofuels were perhaps one of the aspects missed due time constraints highlighted within the document.	March 2003
White Paper on Renewable Energy: Set provisions for renewable energy targets (10000GW by 2013) in South Africa, which would include those from biomass.	November 2003
Integrated Clean Household Energy Strategy: Highlights the potential for alternative fuels as a household energy source, however, remains predominantly focussed on clean cook stoves such as through the Basa Njengo-Magogo programme. Although planned in three phases, the second of which looking into low-emission alternative fuels, no evidence for this programme's continuance has been found.	February 2004
National Treasury programmes: Fuel Levy Exemption for biodiesel (30% from 2003) increased to 40% from 2005. South African Revenue Services allows 100% exemption for producers of biodiesel less than $300m^3$ annually. Renewable Energy Subsidy Scheme with Input Tariffs compiled. (These would undergo a range of changes. The Renewable Energy Input Tariffs of 2009 are administered through the National Energy Regulator of South Africa.)	2003-2005
The Petroleum Products Amendment Act (Act No 58): Provided a basis for replacing of fossil-derived petroleum with sustainable alternatives and provided for licensing of fuel products derived from biomass (subject to further amendments below).	2003
Energy Efficiency Strategy A programme supported by the Capacity Building Project in Energy Efficiency and Renewable Energy and partially funded by the Danish International Development Agency. The first phase (2004 – 2007) focused on public buildings and industry, while the next phase would address the transport and residential sectors. At the time, possible interventions under Phase 2 for the transport sector included vehicle energy efficiency labelling, tax incentives, taxi re-capitalisation, and	2004

moving freight from road to rail.	
Strategy for Renewable Energy: Builds on the White Paper on Renewable Energy and sets out the means by which the national objectives on renewable energy will be implemented.	2005
The Cabinet establishes a Biofuels Task Team with Department of Minerals and Energy as lead.	2005
Integrated Energy Plan II: This plan incorporates RE into the national energy budget. In terms of liquid fuels the plan calls for refineries to increase their capacity and for finished product to be imported to meet any shortfall in domestic production. The plan points to the limited options for the provision of liquid fuels for South Africa, and states that biodiesel production will have a marginal effect on the plan, replacing at most 1-2% of diesel production by 2020.	2005
The Petroleum Products Amendment (2 of 2005) provides a basis for fuels developed from vegetable matter.	Jun 2005
The Cabinet announces it intends developing a Biofuels Industry Strategy (Cabinet Memo (14 of 2005).)	Dec 2005
Accelerated and Shared Growth Initiative (ASGISA) flags biofuels as one of the sectors to propel the country to a 6% growth rate. Biofuels with other industries that are considered labour intensive, rapidly growing sectors worldwide, suited to South African circumstances, and open to opportunities for Broad Based Black Economic Empowerment (BBBEE) and small business development are prioritised.	Feb 2006
Publication of Petroleum Products Amendment Act: In addition to those earlier, this amendment provided specific standards for biodiesel and bioethanol (these are undergoing further amendment)	23 Jun 2006
Biodiesel declared taxable by South African Revenue Services.	15 Apr 2006
National biodiesel standards published by DME.	23 Jun 2006
DME release *draft* National Biofuels Industry Strategy.	Dec 2006
DME announces dates for feedback workshops on *draft* Strategy.	9 Feb 2007
National Biofuels Workshop for Society Groups in Johannesburg.	26 Feb 2007
Biofuels Conference at Stellenbosch University.	7 Mar 2007
Final Strategy Accepted by the Cabinet.	Dec 2007
Draft and final fuel specifications amendments	March 2011 June 2012
Draft and Final Regulations on Mandatory Blending of Biofuels	September 2011 August 2012

Technical details of the Industrial Biofuels Strategy	
Draft Strategy	*Final* Strategy
• Crops: No specific outline; Surplus maize and sugarcane are a key focus. • Target of 4.5% (signalling mandatory	• Crops: Sugarcane, sugar beet, sunflower, canola and soya. maize and *jatropha* are excluded.

blending) biofuels (E8 and B2 ratios) in the national liquid fuels mix by 2013. • A system of subsidies and taxes linked to the oil price. These were calculated to ensure biofuels remained economically viable, supporting producers in case of lower oil prices in the future, while taxing them on a sliding scale to avoid excessive profits. • Seventy-five per cent national renewable energy target of 10000GWh by 2013. • The feasibility scenario results in 55,000 jobs being created (using existing commercial farming employment intensity for the crops considered), reducing unemployment by 1.3 % and being largely focussed in rural areas; economic growth of 0.12 %, or 6 % of the ASGISA targeted increase from 4 to 6%; an average balance of payments saving of R 3.7 billion; and a greenhouse gas emission saving of the order of R100 million pa.	• Up to 400 million litres of agrofuels in national liquid fuel supply per annum = 2% of the total consumption. • Total national average blending ratios of 8% ethanol (E8) in petrol and 2% biodiesel (B2) in diesel (which, despite the total reduction, remains the same ratios as in the *draft* Strategy but area specific). • No mandatory blending required but off-take agreements necessary. • 50% fuel levy exemption for biodiesel. • 100% fuel levy exemption for ethanol (to ensure fairness in gel fuel market – illuminating paraffin also has a 100% exemption). • A fixed margin price of R4.20 per litre for ethanol and R4.88/litre for biodiesel to guarantee producers a return on investment. • Biodiesel plants producing less than 1.2million litres per annum are exempt from fuel tax. • Biofuel manufacturing plants must be licensed to operate for products to qualify for tax exemptions – licenses will only be issued to projects located and procuring feedstock from former homeland or previously disadvantaged farmers.

Having outlined the 'normalised' description of the policy in a little more detail, my aim in the next section to tease out the early motivations, key agents and agencies and the path dependence and trajectories of the policy's genesis and match this with the context described in the previous chapters (and the Appendices). I will focus especially on early aspirations as revealed by a technical review and an emerging 'jobs' narratives and highlight where they have emerged from and why. More so, I will reflect on the main stakeholders involved in the biofuels policy subsystem in its early form up until the establishment of the Biofuels Task Team and the beginning of evidence gathering for the policy development, which is the subject of the next chapter. Taken together this chapter and the following two are an exercise in mapping out what has happened—the biofuels policy *problematique*—providing some interpretation of why it happened and, reflecting back on the contextual discussion of Chapter 1&3 (see also Appendix E), what it might mean from a (developmental) policy perspective.

A FOCUS ON AGENDA SETTING: MULTIPLE ISSUES; MULTIPLE NETWORKS; NOBODY KNOWS

In linear conceptions of policymaking, the early stages are categorised as an agenda-setting phase, yet there is some difficulty in explaining how things come to be part of the agenda in the first place. In this early research, I was trying to identify where the idea for biofuels came from, or rather, why it became a policy idea, largely framed around *industrial* biofuels approaches. The idea was to produce a genesis, that is, identify the origins and mode of formation of the idea of biofuels and how these were translated into a political issue. The importance of such a genesis, as Hogwood and Gunn (1984, p.7) remind us, revolves around "deciding to decide", which in terms of the stages model "involves the identification and anticipation of problems or opportunities which suggest the need to consider action". This deciding to decide has similar underpinnings as 'problem or issue framing' or 'issue filtration'; though issue framing extends more into the political sphere and is not only about deciding what the problem is and how to proceed but also presenting an issue in a way that will likely get the most agreement from others. Rhetorical frames especially, are not unlike narratives in the way they define problems and propose solutions. As Rein and Schön (1993, p.146) highlight, such a frame is a "perspective from which an amorphous, ill-defined, problematic situation can be made sense of and acted on".

To understand policymaking, such activities suggest the need to go beyond technical or rational conceptions of policymaking, which only consider later stages once decisions have been made. As has been highlighted in Chapter 2, linear conceptions are inadequate as problems are socially constructed and those constructions are saturated with power and received wisdom. Social problems and their solutions do not evolve into public (or political) problems as a matter of course and many never make it to the political stage at all. It would also be convenient to suggest that the South African government was influenced directly by the international hype and thus began pursuing biofuels but this is only partially accurate. Most reviews (see Chapter 3) are comfortable proposing that countries see multiple benefits—the win-win narratives—of biofuels, which, apart from reifying these supposed benefits in doing so, fail to recognise that these issues are not simply appropriated from an

international discourse and installed into local contexts.[3] Although the discourse still has legitimising consequences. As Michael Hill (2005) reminds us, policy issues generally emerge as a confluence or continuance of existing issues on the agenda. Delving into such issues guides this chapter but there are two caveats that need to be considered first.

Biofuels are particularly complex and thus, first, it must be stressed that considering 'biofuels' as one agenda is myopic. There are different types of biofuels (see Appendix B) and each has its own history and associated implications. Indeed, it is questionable why bioethanol and biodiesel have been so uncomfortably couched within the same 'biofuels' strategy given the considerable differences that exist between them. This is perhaps a debatable point, as, from an industrial fuels perspective, the combination makes sense (both are linked to a wider fuels infrastructure and are governed as such). From other perspectives, the approach is problematic as biofuels cross many boundaries, spanning especially into the agricultural sector, where the assumptions and variables involved in biofuels production might be better handled individually. The argument could also be extended in the other direction, in that it would be better to 'frame' biofuels within broader parameters of bioenergy, as discussed in earlier chapters, or disaggregate the strategy according to specific activities (rural development, fuel infrastructure and blending, *et cetera*). Ultimately, the next three chapters will illustrate how the industrial biofuels approach has become sacrosanct, and that there has in fact been an underlying tension both between biodiesel and bioethanol approaches and that of the links between different activities. More so, shifting emphases through the development process reflect changing discourses and networks involved.

Second, and related, there have been multiple and divergent interests involved, making any discussion of the policy's development convoluted and confusing. This

[3] Initially, I too was guilty of this, as my questions had focused on origins bearing a simple association with the overall win-win narratives of climate-change, rural development/jobs and energy security, rather than interrogating the individual trajectories each of these had followed in their own rights. The importance is that local narratives and ambitions were in place and legitimized further by the panacea of 'biofuels'. This further emphasizes the structuration arguments that can be made in that whilst actors may be influenced by overarching discourses, they also act to change or subscribe to them. The case of Cradock presents a 'grounded' example of such a situation.

also creates some space for contradictory perspectives to emerge (with equally contradictory findings) as different people have different interpretations of what was happening at various stages. The dramatic flux within government, both in terms of massive changes politically and the ebb and flow of officials within and between departments, not only undermines general activities of the public administration (or results from existing dysfunction) but the consistency of policymaking too (see National Planning Commission 2011c). The Biofuels Strategy was, after all, "nobody's baby" as a former DME official noted. It is for these reasons that I have headed this section as I have, and, in the discussion that follows, I will attempt to weave together an overall story. I take comfort in the fact that even some Task Team members, when asked about the origins of the biofuels policy at the time suggested, "nobody knows". That such little institutional memory exists is a finding in itself but there are, of course, better answers than this.[4]

The Industrial Biofuels Strategy of South Africa: A Genesis of Deciding to Decide

A prudent approach to presenting an outline of the policy process would start at the start and end at the end. In this section, however, I will present the early process as it was presented to me through the course of the research. That is, the story starts somewhere in the middle, with some of the early issues, tangents and threads only being identified much later on. At first, the strategy appeared to have a relatively simple trajectory, progressing through a variety of regulatory and policy proposals from the DME. (It should be noted that, it was also only after discussion with new informants that certain responses from earlier on made sense. That is, the clues were always there, it only became possible to identify them and how they fitted together after further information was grasped.) Nevertheless, the focus is what happens before the stages in which biofuels are expressed as an agricultural, energy-related or

[4] Having noted this lack of institutional memory to be drawn from, the shortcomings of the research are then, first, limited assurance of when exactly things happened, although it should not be assumed that any of the events described occurred abruptly. Policymaking takes time. Second, there is an inherent weakness on relying on secondary accounts, even if it is by people closely involved. The weakness here can be grouped into substantive inaccuracies in which the details provided may be factually inaccurate and subjective, in that they reflect the perceptions and biases of the respondent. However, as it was 'themes' of the process being interrogated, one could relax the need for in-depth specifics and it is of course the perceptions of the policy makers that are central to my arguments, however, biased those perceptions might be.

economic problem to be debated by a Task Team, which is where most of the other reviews of the South African policy start their analyses.

The first important question to be asked is why the strategy (and its feasibility) is so strictly focussed on *industrial* biofuels, rather than a more generalised framework for bioenergy, for example. Answering this question is intrinsically linked to why biofuels are being pursued at all. It also signifies the beginning of the highly contested policy space into which biofuels entered and how original aspirations were changed, added and rejected. Two important influences on the path dependency here emerge from an organisational domain and the overarching agro-industrial imaginary in South Africa. In the next section, I will reflect on the former first and then the latter.

Policy Entrepreneurs in the DME, Bounded Rationalities and Structural Constraints in Deciding to Decide

Dr Rod Crompton, when working within the DME has played an instrumental role in biofuels policies in South Africa. In an interview with him during the early phases of the research it was made clear that biofuels had a far longer policy history than just the Task Team established in 2005 but more importantly, there have been notable inclusions to enable biofuels production in various policies since the White Paper on Renewable energy in 2002 (see Table 3). The White Paper sets out a national goal that 10,000 MW of renewable energy should be added to the national energy mix by 2013. Although not explicit in the Renewable Energy White Paper but emerging in a later Renewable energy framework, Dr Crompton suggested that the general idea was to meet half of this through renewable sources of electricity and the other half of it to be met through biomass, mainly liquid fuels.[5] He further suggested that under his leadership amendments were made to the Petroleum Products Act, which allowed

[5] The Renewable Energy Framework actually puts forward a 60-40 split between electricity and other energy rather than the more generalised 50-50 split mentioned by Dr Crompton. As an illustration of the hype the biofuels strategy created, the DME annual report suggests (DME 2007, p.28):

> [the] strategy will act as a catalyst for the growth of the industry. It is envisaged that the bio-fuels industry would meet 75% of the renewable energy target as outlined in the White Paper of Renewable Energy. This exercise has stimulated a lot of interest, as it, apart from contributing to security of energy supply, also addresses the climate change challenges facing the world.

for a special dispensation for biofuels (or 'fuels from vegetable matter'). Then, in regulations amending the fuel specifications there are also provisions made for biofuels. Finally, he initiated the discussion of biofuels, writing an initial Cabinet Memo that lead to the formal adoption of the Biofuels Task Team (BTT). Dr Crompton then left the DME.

Possibly the most important factor in moving towards this industrial approach is the origins of the strategy's proposals: the actions of our so-called policy entrepreneur and the workings of the DME. Here the determining factor of the policy process correlates with the structural organisation of the DME. Initial proposals for biofuels in South Africa came from the directorate of Hydrocarbons and Energy Planning. At the time, officials in the department were facing limited capacity and, being focussed towards liquid fuels by mandate, they identified liquid biofuels (produced by large-scale producers) as the only viable approach to renewable energy in their line-function. While other 'bio-energy' projects were being undertaken, for example, a clean-cook stove project,[6] there were no resources available for consideration of any wide-ranging bio-energy policy (former BTT member B, DME, 2010). Furthermore, the responsibility for bio-energy (largely in the form of co-generation) resided in a separate line-function and was therefore not included in initial 'biofuels' discussions within the DME. There were also important political alliances and influences in the department at the time. As one informant suggested, the decision was that without much trouble and using existing refineries (Sasol especially was already looking into biofuels) fifty per cent of the renewable energy targets could be met without having to look at alternatives, even if perhaps there were more suitable options (former BTT member C, 2010).

Here it is also pertinent to think about the interests involved in managing an industry from an administrative perspective. Ultimately, although there were clearly other reasons, it is easier to "police" an industrial strategy. As a former chairperson of the BTT suggested:

[6] This programme is not a conventional clean-cook stove in which new cooking apparatus are distributed to beneficiaries. Rather, Basa Njengo Magogo, which roughly translates as 'make your fire like the old woman', encourages people to make fires in such a way that smoke is minimized (CEF 2008a; CEF 2008b).

> *In those early days, there was no subsid[y] but there were tax concessions, which were more easily attached to industrial processes and reconciled later.*

Others have described the industrial focus as necessary as it allows easy (or easier) monitoring of success, especially with regard to the 10,000MW renewable energy targets. This implicitly neglects any 'unquantifiable' energy sources, for example, that of cooking using biomass, even though it is increasingly recognised that these are important energy sources in South Africa (Spalding-Fecher *et al*. 2000). The importance, however, is that the industrial approach incorporated in this case, makes explicit the ability to prove impact with the associated objectives of rendering biofuels manageable and controllable. This would be very difficult to achieve in the 'second' economy or in the messy practices beyond industrial approaches, which are more likely and probably more relevant at local levels

Structural Constraints and Old-School Modernisation

An implicit logic can be identified in the DME's thinking, which reflects a technological lock-in in the wider structural features of the economy. Such 'lock-ins' are considered as systematic barriers to the uptake of (new) more efficient and environmentally benign technologies (Carrillo-Hermosillo, 2006). The existing fuel infrastructure and ascendancy of synthetic fuels and domestic refining during apartheid (see Appendix E) would certainly have a technological 'lock-in' effect in the government pursuing industrial biofuels rather than, for example, considering a wider bio-energy perspective. In South Africa's case though, the development of a domestic synthetic-fuel sector might not necessarily obstruct the uptake of new or sustainable technologies (such as biofuels) but rather limit their diversity to petroleum-based mixes commensurate with existing infrastructure. It should also be recognised that the production of synfuels and a lesser dependence on imported oil than most other countries (Le Roux, 2001) makes energy security slightly less important than other developing countries such as Brazil and India, where biofuels have enjoyed far greater support (e.g. Pradhan and Ruysenaar 2014). However, there is some difference between the priority given to something (energy security) and the way it is thought about (industrial biofuels). In terms of the latter there appears to be very similar approaches—most emphasising high-tech, industrial fuels—as those

embedded within the 'win-win' narratives described earlier and reflecting dominant imaginaries within the emerging bio-economy (Birch & Ponte 2014).

The fuel sector in South Africa (see Appendix E) is a highly regulated space and, having to work within the realms of the fuel sector, the biofuels strategy had to negotiate with a far wider and equally technical assemblage. The inclusion of biofuels into the thoroughly regulated and regimented petroleum infrastructure has actually presented a major 'nuisance' for implementers of the biofuels strategy and not all petrol companies were in support, at least not initially. Despite presentations made by the BTT in the early stages of the development suggesting that there was no objection (Van Coller 2006), negotiations in the background suggested that 'no objection' was very different to 'in support'. As one BTT member suggested, the two are very different things and the fuel companies "*never really came to the party*" (BTT member C, 2010; see also Chapter 3). Nevertheless, these discussions had already internalised that biofuels were an industrial technology, such that biodiesel and bioethanol were to be mixed with the national fuel supply; by this stage, any other options had been obscured from political focus. 'Bioenergy' perspectives were to be debated as separate strategies, as the Feasibility Study would later suggest. It is thus that "chicken shit and biogas" were not to be part of the continuing calculus, as one former BTT chairperson remarked.

While organisational structures have been important, the thinking of the DME during these early stages also reflects ideological underpinnings reminiscent of apartheid's modernisation ideology mentioned in Chapter 3. Such an argument resonates with Sampie Terreblanche's (2012) thinking that new paradigms were "lost in transformation" and the policies and alliances of the African National Congress elite have fortified the minerals-energy complex (MEC). At the centre of the MEC, are the close linkages between the state private capital and 'parastatals' that emerged through key industrial strategies (Fine and Rustomjee, 1996; see Appendix E). As Marais (2011, p.20) notes, through this process "the economy became characterised by corporate conglomeration … cheap coal and a deeply skewed minerals policy", which ultimately curtailed diversification (citing Swilling, 2010). Although fashioned around a development state, South Africa's industrialisation and energy

provision remains transfixed on mega-projects built to allow large "corporate users and wealthy white people inordinate access" (Bond & Ndlovu 2010, p.96). The focus on such MEC-type projects also continue to impose high environmental and social costs on development (Freund 2010). As Ben Fine (2008, p.2) highlights in an update to his original work:

> it seems as if policy is now working itself once more towards a state-led expansion of the MEC-core, reminiscent of the 1970s, through renewal of public investment in state corporations, especially around energy and transport but with as much private participation as can be engendered (domestic conglomerates, FDI and, of course, parasitic BEE).

(A similar argument could be made for the presiding agro-economy and continued calls for transitions in the second economy to match industrialisation in the first economy (see later).) The MEC, or the lingering results of apartheid's modernisation ideology, and, at least in the case of biofuels, its counterpart industrial-agricultural fraternity is important not only by laying down the industrial foundations and agricultural biases within the economy but also the networks that have been established around them. I consider the combination of these two features as an agro-industrial imaginary, which comprises energy and agricultural interests that have very similar aspirations and understandings of the agro-economy and energy supply sector, and the potential of biofuels within those sectors. The label 'industrial' dominates such an imaginary and the visions can be seen in part when looking at the proposed projects of the previous chapter.

Early discussions with officials were indicated that the major players from outside government were Sasol (and to some extent 'Big Oil'), the maize lobby, which included ABSA and Grain-SA, and from 'inside' the IDC, the CEF, the DME and the Department of Trade and Industry (DTI). The confluence of these players is, however, more important at later stages of the policy's development. As such, I will return to the supposed bounded-reality of the DME that I have described above and how this general perception too may not be entirely correct. Doing so also reconfigures the answer to 'why industrial biofuels' from one of 'that was always the case because of the DME' to 'that was the case that was made by experts'. (Of course, this discussion is equally important to illustrate the centrality of a wider

modernisation rational and in some cases the inner working of the agro-industrial imaginary).

Shifting Perspectives, Wider Networks and the 'Forgotten' Origins of Science and Technology

Eugene Visagie and Gisela Prasad (2006, p.8) acknowledge a similar trajectory to the one I have noted of the DME above, in which the DME has set the policy and regulatory framework for the development and implementation of renewable energy. Drawing on Wilson *et al.* (2005), they also recognise the important role of the Department of Science and Technology[7] (DST) in supporting biodiesel during the early 2000s.

> At the request of the Cabinet, the Department of Science and Technology (DST) undertook a national technology audit of the transport fuel sector and recommended that commercial-scale production of biodiesel should be supported. The report highlights the benefits to black, previously disadvantaged farmers. To this end the DST established the Biodiesel Joint Implementation Committee (B-JIC) to coordinate further studies to enable the introduction of biodiesel to South Africa (Wilson *et al*. 2005, p.87).

There are two important issues raised in the above quotation (three if we read into the primacy given to benefits for 'black, previously disadvantaged farmers' when the original audit does not actually present this as a prime objective). The first, points in the direction of energy security and South Africa's unsustainable dependence on oil, which necessitated the audit in the first pace (see Le Roux 2001; below). The second is the parallel processes that have occurred during the early phases of the biofuels policy development, although with somewhat different approaches between the DME and DST.

The Transport Audit

The document entitled "A Technology Audit of the Transport Fuels Sector in South Africa" is the clearest demarcation of a focus on 'industrial' biofuels in South Africa.[8] This document was produced by a panel of experts, headed by Terry Le

[7] The DST was formerly called the Department of Arts, Culture, Science and Technology until it was split in 2004.

[8] The report reflects some of the issues outlined in Appendix E: For example, South Africa is less dependent on oil than other developing countries—it supplies only 20% of the fuel mix (although

Roux and supported by the CSIR. The motivation for such a review emerged from discussions of the Draft Gas Bill and increasing fuel prices and took a "strong slant towards transport fuels" (Le Roux 2001, p.15). The report offers three broad approaches to reducing South Africa's dependence on oil:

- Increasing supply from non-oil sources (that is gas- and coal-to-liquid);
- Switching demand from liquid fuels (e.g. to electricity or hydrogen) or using alternatives (such as ethanol or biodiesel), and
- Reducing demand on liquid fuels (policy options such as increased taxes or switching to rail, as well as technological developments such as vehicle efficiencies).

Although the first two are far more reliant on technological developments, all three require coherent and coordinated policies to be put in place with impacts only likely in the medium to long term.

The important facets of this report for biofuels reside in the discussions of bioethanol (fuel and gel) and biodiesel. Of the two alternative fuels, the panel broadly but cautiously supports biodiesel as a viable pursuit, although one requiring government support to be successful, and are more hesitant towards bioethanol. They consider biodiesel production feasible with an oil price of $25/barrel but this also depends on the comparative price of diesel, the cost of raw materials (feedstock) and the prices of by products.[9] Yet the advantages for rural development and the varying scales at which biodiesel can be produced made it an interesting and potentially important alternative fuel source.

Towards bioethanol, the team are apprehensive and suggest that more research will need to be undertaken. Interestingly, they provide no detail for maize-to-ethanol and

70% of that oil mix is for transport and comes at significant cost). SA also uses more petrol than diesel, which implies that it will end up importing petrol and exporting diesel given the refining infrastructure and demand. The expert panel also makes some bold (although in hindsight wrong) assumptions, expecting the price of oil to be cheaper in ten years (2000 - 2010) if not on par with $20.00/barrel and that the exchange rate would be the real problem. They also cut to the crux of the matter when suggesting that a fuel bill greater than five per cent of GDP could lead to structural problems and deserves attention.

[9] Without an increase in the selling price (i.e. demand) of oil cake there is little chance that biodiesel will in fact be financially viable as the oil cake is actually the more valuable product.

rather focus on the more likely (or appropriate) use of sugar or molasses. (Their apprehension to ethanol will prove important later, given that the focus of the BTT moves in the opposite direction, becoming predominantly focussed on bioethanol, and using maize). There is the suggestion that there are likely employment benefits but following the example other countries—Zimbabwe and Malawi—these benefits will only accrue with significant financial support and also depends on the sugar price. At that time, the sugar price internationally was artificially high and still controlled by the Sugar Act in South Africa. It is for this reason they recommend further research, especially that of cost implications along the entire sugar commodity chain.[10]

A final issue they entertain, and one of particular interest here, is that there is the recommendation that biofuels, biodiesel especially, have associated political incentives. That is, through the government's Integrated Rural Development Framework:

> all Science Councils have been tasked to come up with development strategies for deep rural areas. Biodiesel represented one such innovation. This is a priority area for government and priorities cost money (2001, p.67).

For this reason, they suggest there may be some room for tax allowances, but the experts also warn that these should not be to the detriment of the market. Similarly, given the then forthcoming Rio+10 meeting (World Summit on Sustainable Development) to be held the following year (2002):

> where 130 heads of state are expected to discuss the environment, the South African Government would do well to have something on the table with regard to environmentally-friendly renewable fuels (*ibid.*, p.130).

It is interesting to note that a range of renewable energy legislation and projects were completed in the run up and during the COP17 agreements in Durban (2011) for apparently similar reasons.

[10] During the time of the B-JIC, the DST was also hesitant to work with the sugar sector in South Africa given the apparent tensions between various players and a lack of consensus in the way forward. A similar situation can also be seen in the example of Cradock (Appendix D).

The second important aspect of the Wilson *et al.* (2005) quote above, is that there is parallel process that occurs after the audit, in which the DST takes on a biodiesel focus, whilst the DME appears to maintain a bioethanol focus and remain in control of the policy's formal development. The latter, becomes explicit later on, once the Biofuels Task Team is established but is important also because the DME promulgated the Renewable Energy White Paper shortly after the Transport Technology Audit. This provides an overall platform supporting further developments in the biofuels sector, or at least, sanctions further government review. Up until the point the Task Team is established, the DST seems to be the far more proactive of the two departments,[11] largely because of its own policy entrepreneur: Ms Marjorie Pioos.

Yet the details of this biodiesel focus is what is important, as it also extends well beyond the 2005 Task Team documents and appears to have a far more robust and encompassing agenda than the final prescriptions of the *draft* and *final* strategies. Its tactics were also somewhat different. Again, the trajectory has a lot to do with where it emerges from within the DST itself. As the Deputy Director General, Ms Pioos's portfolio focussed on the economic and social impacts of technology. As part of the DST, such impact was primarily that of research and development and, in her words, of how "to get technology to impact on the ordinary lives of citizens". When discussing the original imperatives of the research, terms like sustainability and market failures in existing agro-commodity chains reflected a wider paradigm than just energy security *per se*, but their attention was equally dominated by a focus on transport fuels given the original transport audit.

[11] It should also be mentioned that the Department of Agriculture, Agricultural Research Council and other research groups both private and public have looked into various aspects of biofuels, biodiesel for on-farm use especially, but were nowhere as comprehensive or at the same scale as what the DST would undertake. In interviews, respondents had also mentioned early research into biodiesel; At van Coller, a veteran of the Department of Agriculture, mentions projects as early as the 1990s. These biodiesel programmes were not 'mainstream' and as research-orientated projects would be unlikely to win any major political support for a large-scale biofuels industry. As he laments, "back then biofuels just weren't sexy".

Following the transport audit's proposals, the DST began a more thorough technical evaluation of biodiesel production in South Africa, engaging in an open dialogue with non-governmental players. Early on, they realised that any biofuels would require a close working relationship with industry in particular, engaging with the National Association of Automobile Manufacturers of South Africa (NAAMSA), and the Construction and Mining Equipment Supplier's Association (CONMESA), the South African Petroleum Industry Association (SAPIA) and a range of other associations representing industry interests. There was also research undertaken on standards, types of fuels and potential feedstock. Part of this research focussed on *jatropha*, as well as a number of endemic oil-rich trees, such as Moringa, which also showed some promise. According to one respondent, the early approaches of the B-JIC also made the financing of projects look a lot more promising, as the plan would be to develop pilot projects and develop these organically through trial and error; starting small and getting larger. There was also far more robust debate around issues, which seems to have diminished as one moves to the Task Team phases, in which stakeholder inputs were perceived to be ignored. (Two 'memos' from the Treasury (National Treasury 2007; National Treasury 2006) seem to corroborate this perception.) Such views may have slightly romanticised the B-JIC's approaches, as other respondents are more matter-of-fact. The work of the JIC was "mostly technical" and because it was technical, there is less room for conflicting debates. It is only when deciding on issues such as the second economy that things become politicised, as another respondent argued.

All of these research programmes were strategising a way forward and evaluating available technologies, feedstock, norms and standards and other technical matters. Biofuels had yet to become politicised. There was, however, also early recognition that if biodiesel was to be taken seriously, it would require legislative changes, which requires Cabinet approval and is formally the mandate of the DME, not the DST.

There are diverging tales of how symbiotic the relationship between the DME and DST was, some considering it a likeminded affair others suggesting more political tension. In an interview with a long-term participant on the JIC and the Biofuels Task Team, the DME was not considered the central player at all early on. Probing such

issues further, this particular respondent was critical of the discernible shift to bioethanol that was considered to reflect the heightened lobbying (for example, from GrainSA and Brazilian interests who were no working closely with the IDC and members of the BTT) and perhaps an increasing pandering to the global discourse of biofuels.[12] With new agendas and increased politicisation, the contribution of the technological aspect was now embedded within broader political processes. The Final Strategy, for example, acknowledges this, whereby it states that (Department of Minerals and Energy 2007, p.7):

> A Department of Science and Technology (DST) led Bio-diesel Joint Implementation Committee conducted a detailed examination and concluded that government supported biodiesel production can be justified due to its environmental and socio-economic benefits.

Such broad acceptance also masks one other important difference between the Task Team and the B-JIC, which also reiterates the concerns of the long-term respondent above and the turn to politicising the process; a million jobs. In these early processes, the hype surrounding job creation indicates shifting approaches and the rise of 'narrative' thinking and political aspirations, at least, beyond the technical fact-finding of the B-JIC.

The myth of the million jobs has also been a difficult one to grapple with, not only because its origins are so long ago but also because no documentation has been provided as evidence of it.[13] Some respondents have told me that a cabinet memo proposing a million jobs never existed; in other cases, people had contradictory memories. For example,

---

[12] As discussed earlier, there is important links here to the global imperative promoted and sustained by a global integrated biofuel network (Mol 2007); or as I discuss later, a local project-orientated network or imaginary taking on similar traits.

[13] This is not due to lack of trying. I have submitted four separate information requests to the Ministers of Agriculture, Energy, Science and Technology and Trade and Industry. While most have responded, the documents are simply not available, or I need to contact relevant departments within the line function and/or the cabinet office. (The cabinet office is not at liberty to divulge information that is the responsibility or property of individual departments.) The Department of Energy, who remains the lead organisation and head of the BTT, is unable to locate these files in their archives. To access any files, I have been told I require their identification codes, which neither the current officials nor I have. Although out of the realms of an extensive discussion here, and much of this may be instances of 'passing the buck' the issue of retaining documents for future use is a massive struggle within many government bureaucracies in South Africa. A few officials have suggested they now keep their own documents, as they know that they will be safe rather than being lost in the system. This, however, raises important challenges for institutional memory and what knowledge is lost when people move from their departments but more so, the consistency and reliability of information that is available.

> *there was never a cabinet memo with a million jobs. We never got to that stage. That was noise that was been made about this million jobs, but we were the ones that went to Cabinet* (Former B-JIC member, 2012).

…and later in the discussion…

> *So, there were two cabinet memos in actual fact. Energy produced one of them with the [million] jobs* (*ibid.*).

Overall, there is agreement from most respondents that the DME had in fact penned a Cabinet Memo suggesting that biofuels could produce a million jobs, although even the number of jobs predicted seems to be vague. Most responses suggest predictions estimated the employment potential of the policy to be well over one million jobs. It is obvious from interviews that certainly before feasibility studies in 2006, there were extremely exaggerated estimates of the job potential. As one former employer of the DME stated:

> *you know in government when we do what is called cabinet memos… it was presented to cabinet to say there was so many million jobs that are going to be created in this industry. So, Cabinet was basically very, very happy* (Former BTT chairperson A, 2010).

Another member of the Biofuels Task Team stated:

> *The reason for that is because in 2003, when the hype started, government promised half a million jobs in biofuels. I then wrote to some important people, saying it's irresponsible … if you look at the economics of how much feedstock we can grow. But I was told to shut up. Cabinet took a decision. Half a million jobs, cast in stone* (BTT member A, 2010).

This was somewhat controversial for the DST, as they had to backtrack on such proposals when jointly presenting to the Cabinet later on. Even according to their research, such promises were not justifiable. One can of course imagine the appeal of such predictions and especially that they would involve low-skilled jobs in the rural economy.

How the Cabinet reacted is also difficult to discern. Overall, it seems that, contrary to expectations, the reaction was in some cases a negative one; the Cabinet wanted to

see some 'real figures' and some recognised that the DME was only trying to 'sell the strategy'.

> *You see, I think it was the fact that minister Manual was the Minister of Finance and was a very dominant voice in 2005 and he lead the charge to say this is not about job creation, other people in government do that, not you!* (Former BTT chairperson B, 2010).

Another respondent described it as:

> *Trevor Manual was very sharp and he wanted to be briefed and open to advice. That's the weird thing [about] ministers, they [can be] arrogant and policies are a gut feeling. If you give them analysis that shows them something else, that says they are on the wrong path, then he [or she] will ignore it. Manual was not like that, he wanted analysis to inform it, it wasn't emotive, and he had been part of the process as it unfolded and he had been part of Cabinet a long time and saw how energy was exploiting this; [selling] employment creation and [that] it was just a ridiculous number they came up with* (Former BTT member A, 2012).

One has to acknowledge, however, that the job potential appealed to some Cabinet Ministers more than others.

> *Okay, so then we go away and prepared the energy approach to it. Then the subcommittee we had to report to involved the minister of agriculture, minister of energy, I know Jeff Radebe was there but I am not sure what he was Minister of, maybe transport. Anyway, they informed me, they said talk to me about jobs, this whole thing is about job creation. It basically differed depending on which Minister you spoke to … You know they make a decision on one day but then if there are some that are absent on another day then they make a different decision* (Former BTT chairperson B, 2010).

Regardless of estimations, and evidence-based retractions (see also next chapter), hype around job creation, especially within the rural (second) economy, was a major factor galvanising political support. On the 7 December 2005 Cabinet approved ***"****the development of an industrial strategy* ***targeted at creating jobs*** *in the energy crops and bio-fuels value chain acting as a* ***bridge from the second economy to first***

economy status" (see also DME, 2006; Mtwa, 2007 emphasis in original). The Cabinet subsequently granted formal support to the development of a Biofuels Task Team in 2005, which would then undertake the feasibility studies.

International Lobbies and Discourse Coalitions: Fuelling the Jobs Hype

A range of factors have combined to attract the necessary political support for a biofuels strategy, giving preference to bioethanol and making biofuels 'sexy', politically speaking. Although respondents from the different departments have somewhat different recollections, they have similar stories. All parties admit that the million jobs shifted the discussion and raised the expectations of the Cabinet. Whether it was 'noise' or a formal Cabinet memo seems less important than the implications. There had, up until the supposed memo, been a relatively technical review, which then became embedded in discussions that were more political. The local hype was setting in, and what makes it more forceful that it was a story being compounded by international advocacy and local interests seeing potential new markets.

> [Respondent] *There were a large number of European businesses coming to say they had the technology.*
>
> [Interviewer] And they seem to have also perpetuated the job thing as well?
>
> [Respondent] *Absolutely, they came with technology and unrealistic technology but what was very frightening was they were arguing for jatropha as the cure all, wonder crop! We of course had to play the strongest role to come and answer to these claims...* (Former B-JIC member, 2012).[14]

Clearly, there were divergent interests at play, which had to be synthesised into a consensual and coherent policy. Given the final direction of the Feasibility Study (see next Chapter) and strategy itself, it appears that bioethanol has taken centre stage (and with Cradock as the vanguard project, ethanol dominates implementation too). The reasons for this have been laid down to vested interests according to some,

[14] For interest sake, the rest of this discussion revolved around the fact the DST had done the necessary research that disproved the hype around *jatropha*.

or dollars and cents according to others. The absolute veracity of each of these is difficult to assess but it is more likely a case of both feeding off one another than anything else (see previous chapter).

For one, prior to the main feasibility, and perhaps even the establishment of the Biofuels Task Team, foreign interests were advocating expansion of the biofuel sector, which would, in addition to biodiesel interests (PhytoE*nergy* especially), then include bioethanol as well. Brazil, for example, was actively pushing bioethanol due to their own successes (with potential for profitable technology transfer), while there was also notable pressure from German interests looking into biodiesel (to meet their European Union policy obligations). Being high-level agreements involving fact-finding missions, research visits and workshops, it has been difficult to investigate the aspirations and agendas of individual players for the South African context (though some of these details are covered in the previous chapter). From the perspectives of those members of the Task Team interviewed, the international agendas were significant. For example, as one member of the Task Team reported:

> *[the Task Team] also worked very closely with Brazil – we visited them about ten times. There was a committee and we looked at the technical and social structure around biofuels because Brazil has a similar economy to SA not in terms of size but in terms of poverty et cetera* (Former BTT member D, CEF, 2010)

Those involved with the Feasibility Study also suggested the maize–to-ethanol projects in the United States of America as providing an example to be followed.

> *I think the farming sector was probably the driver behind [the policy], like the maize growers in the US and Brazil was pushing Sugarcane to basically raise the price of commodities. So you had someone pushing it so it became sort of trendy…* (Consultant, B 2010).

In lieu of wider lobbying from interest groups in and outside South Africa, the hydrocarbons unit of the DME began articulating biofuels in new ways, largely in terms of 'development' and job creation mentioned above. These development narratives were pivotal in harvesting considerable political support and outpaced or overshadowed the technical work being done by the DST. Broadly classed as that of

proposed job opportunities and rural development, advocates latched onto and deployed these narratives, which subsequently took on a life of their own; one different to the global biofuels meta-narrative in which political support has mostly been immediate and extensive (at least in the early stages). Assumptions around job creation were embedded in the rationale of pursuing biofuels, with such support originating even prior to feasibility (which was supposed to establish the actual number of jobs created). And again, these narratives resonate powerfully with existing conceptions of rural development in the compartmentalised second economy. Biofuels become a neat policy and technology fix, and with projects being proposed in the former homelands of the Eastern Cape, they easily become a political fix as well.

Stories from respondents are, however, conflicting. That the jobs narrative played a significant role in cementing support has to be considered in the face of some respondents considering the political hierarchy to be somewhat ambivalent to the DME providing jobs security through the aspirations of a biofuels program. This ambivalence, which I have described above already, carries through the process – with some Ministers objecting to the strategy throughout (see Chapter 7). Despite some cleavages, however, the jobs rhetoric harnessed within the industrial biofuels imaginary resonated strongly with the aspirations of the Accelerated and Shared Growth Initiative for South Africa (ASGISA), spearheaded by the then Deputy President, Phumzile Mlambo-Ngcuka.[15] Indeed, biofuels became an important feature of the ASGISA framework (prior to any investigation of their potential and practical successes). The ASGISA discussion document suggests (Phumzile Mlambo-Ngcuka, 2006, p. 7)[16]:

> provinces were asked to propose special projects that would have a major impact on accelerating and sharing growth. A set of [biofuels] projects has been selected for finalisation of implementation plans. Some of these projects are already underway. They are an initiative that will cover at least Northern Cape, Free State, KZN, Eastern Cape and Mpumalanga.

[15] Mlambo-Ngcuka, the Minister for Minerals and Energy prior to becoming Deputy President, was an early advocate of renewable energy, proposing in a parliamentary speech that the share of renewable energy, though small at the time, was intended to increase it to about 14% by 2014 (Mlambo-Ngcuka 2003).

[16] Later on, the final Biofuels Strategy (Department of Minerals and Energy 2007, p.8) would return the favour, suggesting:

[b]iofuels plant investment can be a catalyst for the transformation of rural economies and contribute to the government's Accelerated and Shared Growth Initiative (AsgiSA).

This is important for two reasons amongst others. The first is that there is, before a strategy or policy document has been tabled, an implicit assumption that biofuels projects will be successful and neatly conform to the aspirations of ASGISA (unclear as those actually are). Even though the document later recognises that biofuels are in a "less developed stage" they share a common ASGISA orientation by being a "labour intensive, rapidly growing sector worldwide, suited to South African circumstances, and open to opportunities for Broad-Based Black Economic Empowerment (BBBEE) and small business development" (Phumzile Mlambo-Ngcuka, 2006, p. 7).

The second, is that such statements reinforce the argument that projects (or rather their proponents) and the buy-in they receive from the jobs hype, reaches beyond the realms of the biofuels policy itself and acquire the status of policy artefacts to be reproduced within other policy realms. In the same way, the language of biofuels began to legitimise programmes in the Eastern Cape, their currency is easily 'cut and pasted' into national policies too. If one goes by what was planned for ASGISA, they almost become the policy. A former BTT chairperson summed it up as follows:

> [Respondent] *The way it worked, I look at it from two fronts. When Rod sold this, he did so using the jobs in the second economy. You must remember also the timing was the same as ASGISA which was been pushed by our then Minister, Phumzile [Mlambo-Nqcuka], so we were all putting forward projects that we thought would result is in growth of jobs and clearly biofuels was put forward as something that could potentially create 6million jobs in the second economy*
>
> [Interviewer] Which is obviously something of a plus...?
>
> [Respondent] *Correct. So it basically appealed to the powers that be on that basis* (Former BTT Chairperson C, 2011).

CONCLUSION

Earlier chapters have considered the global reach of the biofuel discourse (and the global character of its networks and flows) but highlighted that there are local

dynamics of interest too. In South Africa, the policymaking process has circumscribed and is indicative of much of these dynamics. A useful way to interrogate this process is to start examining how biofuels became part of the political agenda or 'deciding to decide' in the first place, providing a genealogy of their development into policy.

The early research homed in on DME officials, who readily accepted responsibility for putting biofuels on the agenda, and, through institutional rationales and organisational structures, there were clear reasons for an industrial focus being taken (and at that point, unbeknownst to me, bioethanol was the preferred option despite an earlier focus on biodiesel). The bounded rationality of the DME itself expresses an underlying bias towards the MEC or modernisation ideologies seen also during apartheid, with a close-knit network and ideas shared between 'big oil', 'big agriculture' and the DME, suggesting that there was an agro-industrial imaginary (political uptake of science and technology) in the making. This was, however, only part of the story.

The more apparent locus for industrial fuels was located in earlier studies, when issues of oil dependence came to the fore in South Africa. Similar issues were being encountered internationally, as can be seen through the biofuels directives in the EU. Biodiesel was the preferred biofuel option (which was one of many other options), and the DST followed this preference on with a variety of research programmes working towards a biodiesel programme. It is noteworthy that the underlying paradigm was still that of industrial approaches, and it is the explicit demand for transport fuels within the macro-economy that has fashioned the emerging policies and practices, which have since then become mixed with other objectives. The overriding objective of energy security and developing an alternative fuel has therefore been diluted and reconfigured. While the DST were taking a more measured approach to biodiesel in various applications, the DME had the idea to 'go big' and focus on creating as many jobs as possible with biofuels as the vehicle to do so. As a former BTT chairperson remarked:

> *When we started it, Dr Rod Crompton came up with this target of a million jobs from biofuels, that was his goal, and then*

> *everybody just slashed the target away and eventually it was no longer the target. So he said let's be bold, let's put it out there, and he had the right idea, you know, he said let's envision it for a million jobs. Why shouldn't we be looking to create a million jobs with all the benefits? It was different departments that then chipped away the target* (Former BTT chairperson, D, 2012).

While amicable, these goals increasingly competed with aspirations of climate change reduction, rural development and many of those proposed within the biofuels hype (and overwhelming discourse) and were contrary to what the DST research had suggested was feasible (see also next chapter) and some politicians had begun to see this. Certainly, potential exists for each of these objectives to come to fruition; however, most respondents have suggested that it simply became too difficult to isolate what the purpose of biofuels would be (discussed further in Chapter 7).

An important consideration here is the complexity that a simple technological shift actually confronts within the policy subsystem. Biofuels not only represented different things to different people, and hence a wide array of objectives, their uptake was galvanised by narratives of job creation and rural development that permeated through government and political realms in very different but equally important ways. Overall, there was an appreciation for the potential benefits so political support continued and the DME progressed towards an industrial biofuels strategy configured around their interpretations of what this should look like. These interpretations have been influenced by not only underlying logics and ideologies but, as we shall see, have been shifted by interests that built upon the emerging hype and would legitimised by the formal Feasibility Study of the Biofuels Task Team being undertaken.

In summary then, running parallel to the DST research there were two important axes evident in the early development of the strategy. On the one hand, in finding ways to meet the renewable energy targets, the DME was engaged in its own 'technical' process (although with an agro-commercial pre-disposition driven by existing networks and influence within the DME), regardless of the job potential but also reliant on its discursive power. On the other hand, there was a strong political underpinning hoping that the biofuels sector would be a *quick fix* for at least some of

the country's unemployment woes, especially in the so-called second economy, also fuelled by the jobs rhetoric. Foreign involvement is important as a third axis, however, has been difficult to actively unpack as part of this early research. All of the agendas have, however, coalesced around the narratives of 'employment' and 'rural development' but at the same time, the path dependency created by the DME and existing networks, following an agro-industrial script, have constrained the inclusion of wider perspectives in the formative stages of the policy process. As I will argue in later chapters, these issues conflict quite fundamentally, an issue that remains unresolved through the rest of policy-making process and ostensibly practice too. First however, it is necessary to consider how these narratives were substantiated, as Godin (2009) suggests, narratives need to be verified by statistics to qualify the new phenomenon. Similarly, policy needs to be evidence-based and a Feasibility Study is fundamental to identifying what is viable and what is not, as well as steering the policy-makers in the right direction, at least in principle. I shall interrogate this Feasibility Study in next chapter.

CHAPTER 6: EVIDENCE-BASED POLICYMAKING AND THE BIOFUELS STRATEGY

In the early development of the strategy, there were two important axes evident. Moving in one direction were the cumulative concerns of meeting the renewable energy targets and 'satisficing' a range of other issues. Along this axis, there were somewhat different perspectives between the DST and DME. The culmination was a 'technical' process exhibiting an agro-commercial and industrial pre-disposition driven by existing networks and influence within the DME. The second major trajectory had a strong ideological underpinning, with the political hierarchy hoping that the biofuels sector would be a *quick fix* for at least some of the country's unemployment woes, especially in the so-called second economy. Foreign involvement is important as a third axis, however, has been difficult to unpack in significant detail as part of this research except as has been described along with the projects through which their support was manifest. None of these axes is mutually exclusive. Narratives of 'employment' and 'rural development' have provided a common thread between perspectives but it is necessary to consider how these narratives were substantiated to be sufficient as a basis for the strategy. As Godin (2009) suggests, narratives need to be verified by statistics to qualify the new phenomenon. Similarly, following aspirations of New Public Management described earlier, policy in South Africa should be evidence-based. In the case of the BISSA, a Feasibility Study was fundamental to identifying what was viable and what was not, steering the policy-makers in the right direction, at least in principle.

The widespread call for evidence-based policymaking in the South African context was therefore considered equally essential for biofuels. There has, however, been only limited empirical critique of whether this is a possibility for biofuels in general,[1] given their complexity, and specifically in South Africa, given the normative calls for such approaches. There are two ways one could interrogate this further. The first is to propose adequate toolkits with which to undertake policy analysis and provide

[1] While there has been numerous studies looking into the complexity of biofuels, very few have studied how such complexity, or rather understandings of such complexity, have been translated into policy ideas. Only a few studies have begun such research, as is discussed further below.

the best possible information for policy-makers or evaluate those used thus far. This is not a direction I intend to take here but is certainly of pressing importance. The other, a more critical approach consistent with the original definitions of policy studies in Chapter 2, is interrogating the way in which such toolkits and evidence-producing activities are conceptualised, undertaken and informs the wider policymaking process.

There have been some forerunners to such a study. In the case of the European Union, for example, Sharman and Holmes (2010) argue that policy has dictated the evidence to be gathered rather than the other way round. They interrogate the ten per cent renewable energy and concomitant biofuels target, critically assessing its political motivations and use of scientific evidence in its formulation. Overall, the actions of an individual policy entrepreneur, whose considerable degree of control over scientific data and understanding of the established literature, allowed a significant degree of command over proposals to "ensure the target proceeded in the face of considerable internal and external opposition" (*ibid.*, p.316). This to some degree undermines what could be considered the objectivity of social science,[2] highlighting a value-laden character, but also raises concerns as to the use of experts and the credibility of research undertaken within or for the policymaking process. This is an important point of departure from which to consider how such evidence gathering or evidence making has occurred in South Africa.[3] To begin with, I will outline some existing theories of the relationship between scientific knowledge and policy and from there interrogate the knowledge-policy interface of the biofuels strategy. In this instance, it is not so much a question of 'scientific knowledge' as a basis for policy, but using critiques of the relationship between such knowledge and

[2] I specify social science here as I wish to make no general claims or arguments for the objectivity of science in general, including the physical sciences. Much of the discussion of how science is used in policy is similar to both physical and social sciences and the evidence they produce. The important point being that one should treat all 'evidence' with caution not for its objectivity (though this is obviously important) but how it is used. Lee *et al.* (2005 cited in Hodgson and Irving, 2007) reflect Yearley's (2005) findings that scientists do not normally undertake research to give advice, whereby, "political decisions about social policies rarely are the direct outcome of social science research" (Lee *et al.* 2005, p.21). There are also earlier criticisms of the ability of social (and physical) sciences to provide suitable solutions to (political) problems that will be discussed later.

[3] Drawing on the research from this chapter and the next, Pradhan and Ruysenaar (*forthcoming*) work toward similar conclusions as Sharman and Holmes (2010), however, this chapter elaborates the process and delves into the theoretical context a little further than they were able to.

policy to interrogate evidence in policy and the 'credibility' it acquires through calls to science and expertise and by extension how the Feasibility Study draws on scientific ideas.

KNOWLEDGE AND POLICY: SPEAKING (SCIENTIFIC) TRUTH TO POWER OR POLICY-BASED EVIDENCE GATHERING

In the theory chapter, it was briefly mentioned that the social study of science has important implications for the way we conceive the use of knowledge and evidence in policymaking. Why this is important is that South Africa, like many other public administrations, premises its decisions on the promises of evidence-based policymaking. When the Biofuels Industrial Policy was being developed, there were increasing political aspirations for an instrumental policy focus in line with New Public Management and its cornerstone, evidence-based policy. This remains the case as the current president Jacob Zuma, in his address to the National Planning Commission, also isolates an increasingly important aspect of policy-making in South Africa. He urges those with expertise to "put forward solid research, sound evidence and clear recommendations for government" (Jacob Zuma cited in National Planning Commission 2011a, p.1).

Furthermore, according to a CSIR workshop in 2008, there "seem to be strong links within the science and policy-making communities respectively (Funke *et al.* 2009, p. 21). While they suggest that links between national-level departments and some research agencies appear robust, there are weaknesses too. Links with international research findings, which may have important lessons for South Africa, appear to have been missed. They then suggest that links may be improved through:

- better relationship management;
- knowledge brokering to improve the relevance of science knowledge to government, for example between science councils and government, and
- increased scope for improving the relevance of the science that the science councils are doing.

In many ways, the CSIR's reflections are indicative of an overarching discourse in which evidence-based policy has become the dominant feature in thinking about the

linkage between social science (evidence gathering) and social action (policymaking and intervention). Professor Andries du Toit (2012, p.21) criticises this seemingly natural relationship and argues that:

> while the desire to ensure that policymaking is informed by social science may be laudable, the assumptions underlying these assertions about the role of evidence and science turn out to be dubious, and provide a poor guide to the challenges involved.

From a development perspective, Sumner and Tewari (2009) raise similar concerns of whether evidence-based policy will be pro-poor. They suggest two main features working against the value of evidence-based policy in that there is both the possibility for poor quality evidence and a scarcity of good evidence, both of which also depends on the ability of policymakers to use it properly. The use of evidence also needs to be considered in more than practical terms[4] recognising the importance of 'Foucaultian' power-knowledge and 'Latourian' questions of whose evidence counts. The potential exists that what classifies as best evidence may be biased or structured through existing power relations and local experience is considered less important than mathematical models.

The above introduction suggests that the relationship of social science or evidence and decisions made using such information is contentious. The difficulty is that, as Sanderson (2002) suggests, the continuing call for evidence in policymaking "reflects a modernist faith in progress informed by reason", despite severe criticism from constructivist and post-modernist perspectives. The ideas here are similar to those captured in Chapter 2, in which there is a cleavage between positivist perspectives and interpretivist ones. Rationalists argue objective knowledge is translated and forms the basis of instrumental decision making whilst interpretivists highlight a process of deliberation that "weighs beliefs, principles and actions under conditions of multiple frames for the interpretation and evaluation of the world"

[4] Though outside of the requirements here there has been an increasing turn towards 'evidence' in development policy, especially through the use of randomised controlled trials, systematic reviews and the limited ability to measure the potential impact and efficacy of a given intervention. Biofuels are particularly problematic in this regard and their complexity underlines the limits of evidence in policymaking to be discussed in this chapter. Arturo Israel (1987), a theorist of institutional development, pre-empts such ideas in terms of 'specificity' and argues that key areas of rural development policy, such as agriculture and natural resource management, are inherently of low specificity, as the exact outputs demanded of staff and the steps for achieving them are hard to precisely define, making monitoring of performance correspondingly highly complex (cited by Keeley & Scoones 2003).

(Dryzek 1990 cited in Van der Kaap 1995, p.202).[5] It would be wrong to forego some of the important lessons such criticisms bring to bear on our understanding of how science and evidence informs the policymaking process even though, as Sanderson (2002) argues, there is still much need and potential for 'grounded knowledge'. (The point really being that whilst normative ideas of evidence in policy reflect our best attempts at gathering as accurate a view of objective reality (although epistemological disputes continue), there is always room for manoeuvre and policymaking realistically does not happen in a perfectly instrumental way.) Therefore, before presenting the empirical review of the Feasibility Study and its evolution, I will draw out some of the important themes of critique and contention relating to scientific knowledge as a basis for policymaking. Whilst not denying the importance of instrumentalist objections, several themes may be highlighted when considering the use of evidence and the role it plays in policymaking. Such themes include what counts as evidence, how it may be produced, how it is used, and how people respond to it,[6] with the historicist insistence that these differ between specific spaces and times.

As Andries du Toit (2012) suggests, there are inherently two activities manifest in evidence-based policymaking—the social practice of producing evidence and the second using such evidence to make policy. In terms of the former, Yearley (2005) summarises two conventional understandings of why evidence-based policy can

[5] Post-modernist perspectives take this even further, in which they refute entirely the notion of an objective external world and the search for a meta-narrative to provide a secure foundation of knowledge (Cf. Sanderson, 2002, p.7).

[6] I will not dwell on this latter feature in depth here. Yearley (2005) provides a useful discussion of the nature of contemporary disquiet with expertise than conventional views. One has to acknowledge that people (laypersons) are more involved in many aspects of knowledge creation—sometimes working through science and sometimes through local knowledge(s). This is also a more complex relationship than just a 'public understanding of science' or a deficit model between scientists and the lay public. The deficit model, emanating from studies into the public understanding of science, hypothesizes that the 'problem' with using expert knowledge and science is that people do not understand the science and therefore reject it. Scholars working within STS, as described in text, argue that this is not always the case and often people not only understand the science but also participate in the generation of such knowledge. Additionally, in public contexts, scientific assertions often depend on unexamined assumptions about the social world - how people will use a product or regulators will perform, as well as how the public have informed the science that is made available. One could also include here Beck's idea of the Risk Society (Beck, 1992, 1995, 1997; Beck *et al*, 1994; see also Giddens, 1999), in which what he terms 'reflexive modernisation', science no longer offers control and predictability but rather creates risks and uncertainties that result from scientific discovery and technical change. This changes the relationship of science to policy, in which policy now has to account for the consequence of science rather than merely being informed by it.

become weak in practice in addition to the discussion of Sumner and Tewari (2009). The first is procedural and involves circumstances in which a scientist's independence is compromised; that is, their research is partial, or their views become partisan or swayed by material interest or incentive. The second is a more fundamental disjuncture in which the questions scientists ask themselves are not the types of questions that policymakers require answers for. Science has no predetermined policy-relevance.

Considering Evidence and Science

That policy should be based on researched evidence begs the question of what evidence actually is, ontologically, and how it can be derived, epistemologically. The former, according to Hodgson and Irving (2007b, p.195) has "taxed philosophers for some time, and will continue to do so". Broadly, one could define evidence as anything presented in support of an assertion but some central characteristics are important. First, there need not be only one type of evidence. Though *scientific* evidence is sacrosanct within the evidence-based policy discourse, there are of course other types of evidence, which may include anecdotal evidence, intuition, personal experience, and testimonies emanating from a range of sources, from institutional, political and professional origins (and could include that of the client/stakeholder/lay public too) (Head 2008). The credibility of these, however, may also be subject to widely varying, normative criteria such as accuracy, precision, sufficiency, 'representedness', authority and clarity (Dyer 2006).

A thorough ontology is outside the realms of this thesis and as Hodgson and Irving (2007b) suggest, it is perhaps better to question what evidence is taken as unproblematic.[7] Overall, the credibility or importance of evidence in evidence-based policy is directly linked to rational, modernist aspirations, in which science is paramount. As Yearley (2005) reminds us, "on the face of it, as science is the best knowledge we have of how the world works, it is wholly understandable that scientists will be important providers of advice for governments and policymakers".

[7] One could extend this to ask who takes evidence as being problematic and who does not? As in my introduction, this will be considered further in the empirical discussion below. Parallel with problematising evidence, one has to acknowledge that many policies develop in the absence of any so-called evidence.

Through the scientific method, knowledge and evidence can be produced (in the form of published research or accepted causal relationships) that is clear, concise, rational and objective. In many ways, subscribing to scientific knowledge in this way reflects a long-standing assumption of the 'purity of science', hegemony of 'scientized' thinking and the objective function scientists perform in discovering the truth. There is of course a controversy of what exactly is meant by 'good science' (Grundmann 1996 citing Jasonoff 1990, Nelkin 1979, Porter 1995, Wynne 1992; see also Yearley 2005 and below). Du Toit (2012), for example, describes evidence in evidence-based policy as appealing to a "naïve empiricism", in which understanding social reality is a matter of understanding the evidence, which also depends on having enough evidence. Stone (2002) and subsequent scholars have referred to this as the rationality project, which reflects a notion of scientific evidence as obtainable when this is not always the case, especially when it comes to the needs of policymakers and the questions they ask (see also Weinberg 1972). Similarly, scientific research can certainly provide a *basis* for decision-making but is not generally undertaken to provide *advice*. Such sentiment is expressed by Morgenthau (1965), for example, who surmised that the social sciences necessarily provided only partial guidance in the face of "ultimate decisions" about how we are to live our lives.

Considering Evidence in Policymaking: Understandings from Science and Technology Studies

The situation is thus that evidence, whether science-based or not, is highly problematic. It is problematic in and of itself (although one should not automatically and unreservedly discount its legitimacy), as described above, but science and research—understanding how the world works so to speak—also do not neatly or automatically translate into good policymaking (Du Toit, 2012; Yearley, 2005). The problem is that evidence does not speak for itself, scientists and knowledge brokers do, and hence discursive practices and power-knowledge cannot be neglected as part of the science-policy process; that is, the second activity noted by Du Toit (2012). Despite the above criticisms of science and normative assumptions of what evidence is, the idea of objective evidence becomes even more problematic when it is embedded within the dynamics of policymaking. One can see this when, even in the

face of contradictory evidence, narratives and worldviews remain steadfast and interpretations are sense-making practices rather than instrumental outlooks. Steven Yearley (2005) (from whom I have taken the main section heading but see also Jasanoff (2003b); Wildavsky (1987))[8] emphasises understandings of this relationship from 'Social Studies of Science'. Such a perspective is useful as it not only interrogates the relationship of science and policy but starts from an understanding of science as a social practice, and then moves towards challenges in using the knowledge produced by science as a basis for policy (and indeed science's place in wider society).

Before taking a critical tack, others have more optimism of the relationship between science and policy. Roger Pielke (2007), for example, provides one view of the situation, calling for scientist advisors to be a type of honest broker. He advocates a situation in which scientists provide input into policy decisions without compromising the sanctity of science's claims of providing impartial empirical evidence. However, in many ways this neglects well-founded suggestions from, for example, Collingridge and Reeve (1986) that this is impossible; although to a degree Pielke does recognise this. Whereas Pielke motivates a range of ideas as to why science matters to policymakers, and how they might use it, he dwells on an overly reductionist view of science, even though acknowledging that politicians ultimately decide what is done (or not done) with it.[9]

In countering this optimism, and in addition to the weaknesses of evidence from a procedural and content perspective, a 'science studies' critique provides a more complex but comprehensive grasp of the situation. Drawing on Collingridge and Reeve (1986), an 'over-critical model' suggests that the actual features of science-for-policy make it unworthy as an aid to policymaking and the ideal of scientist-as-

[8] While knowledge might not get established in policy in a straightforward manner, it is still assumed that policymaking pertaining to various fields, particularly science and technology, agriculture, and environment is driven by scientific knowledge (Keeley 2003). Hence scientists and experts are called upon to speak "truth to power" (Jasanoff 2003a) and based on these facts policy-makers choose between or develop various policy options.

[9] As an example one could reflect here on the neglect of a 'reality-based community' in United States policy-making within the Bush Administration (Suskind 2004) and the general postmodernist turn in social sciences that policy makers, actors and analysts are situated in space and worldview, rendering impossible the quest for objective information, generalised models and universally applicable laws (Hodgson & Irving 2007b).

advisor is inaccurate of what happens and misleading as an ambition. Four assumptions underpin this ill-conceived ideal (see Yearley, 2005 p.164-165). First, it is assumed that scientific knowledge is developed autonomously and then becomes relevant to policy. Rather, scientists investigate issues because of their policy relevance (especially topics that in many cases would have been entirely neglected or deliberately ignored because of methodological issues or plain disinterest). Second, policy questions are thought to conform neatly to scientific disciplines (or are inter-disciplinarily answerable), when, in practice, such questions cross disciplines (and can result in conflict as much as consensus).

Third, there is the belief that scientific answers are conclusive when the characteristics of policy-orientated questions may actually lead to interminable disagreement. Rather than narrowing down uncertainties, further research may make answers even less conclusive and have different interpretations. More pragmatically, potential winners and losers of policy proposals can find evidence to back their causes and scientists easily disagree as to who is right and who is wrong. Finally, scientific advisors are supposed to be impartial but in policy (and thereby political) matters indifference is not a possibility. There is also more at stake. Scientists and policy advisors have to pay a great deal of attention to the costs of being wrong in policymaking, when in normal science such uncertainty is assumed as part of the on-going knowledge generation process. This changes the approach and redefines what findings or conclusions are deemed as appropriate. That is, recommendations are not necessarily based on accuracy or evidence but lowest common denominators or safest bets.

There is an overarching theme here in which the normative discourse of evidence-based policy (a policy about policy), that is statements of what the relationship between science and policy ‘ought to be’ (Du Toit 2012), does not match with ‘reality’. Yearley (2005, p.165) sums this up suggesting: “those features of scientific expertise which supposedly made it so suitable for advice-giving do not hold true in practice”. The favourable dependence on science advice is then, in the words of

Collingridge and Reeve (1986) 'mythical'.[10] On top of dispelling the myth that science is capable of generating comprehensive information relevant to a policy dilemma, they also suggest that policymakers themselves do not have access to or collect all the relevant information to an issue but work in a situation of great uncertainty. Whilst doing so they also tend to represent certainty.

The critiques discussed should not be considered part of a one-sided attack on scientists and experts and the value of expert advice they provide for policymakers; both are of obvious importance. From the above discussion, the "relationship between political authorities need for advice and the generation of scientific insights is therefore complex and indirect" (Yearley 2005, p.160). On the one hand, separating the practice of evidence gathering and then its use in policymaking highlights problems in both aspects, individually, but also that the separation of providing evidence (speaking truth to power) and making decisions (wielding power) are actually not so easily separable and discrete. It should also be remembered that criticisms marginalising the value of science and evidence (and thus scientists and experts) may also fail to account for the sometimes-significant role that science and individual scientists play in framing policy problems. Expertise and evidence, even if uncertain, can sway political discussions and decisions (as did the Transport Fuels Audit), whilst also creating policy problems when doing so (Neff 2007; Rich 2004).

Two Examples of the Interaction between Science and Policy

Two areas of research have begun to illustrate some important practicalities of the STS theories mentioned above, namely: technocracy and epistemic communities.

[10] Collingridge and Reeves (1986, p. 5) state it as: "Contrary to the myth of the power of science, there is a fundamental and profound mismatch between the needs of policy and the requirements for efficient research within science which forbids science any real influence on decision-making".

Epistemic Communities[11]

The first example of the role of the scientist and science in the policy process is the way in which Epistemic Communities (ECs) inform international affairs, notably international regimes and the activities of international agencies.

Peter Haas (1992; 1989), defines the importance of expertise at the international level in terms of epistemic communities, which articulate cause-and-effect relationships associated with complex problems, frame issues for collective debate and propose specific policies in response. To Haas, an EC is a scientific research group with shared beliefs, underscored by causal (scientific) understandings and theories as well as common assumptions of what is valid (that is, the scientific method).[12] These communities provide expertise and answers to policymakers, helping to legitimise the enforcement of international regimes (or other institutional arrangements). From relatively clear-cut notions, the idea of epistemic communities and the role they play has encountered some critique. Jansen and Roquos (2005) summarise an earlier criticism of Haas's work by Grundman (1996), in which Haas's theory of consensus-making is not an inherent characteristic of epistemic communities and their roles. Their summary of Grundman (1996) is that he proposes that "reason may not defeat economic interests" and denies the "centrality of cognitive elements pointing more toward power relations" (1996, p.143). Drawing from Science and Technologies Studies, Jansen and Roquas (2005) critique both these perspectives highlighting that the polarisation between scientific expertise/truth and policy/politics still clouds efforts to understand science advice at the international level. They deny the likelihood those scientists in international expertise networks simply translate technical scientific arguments into policy advice and regulatory frameworks (Haas) or are simply instruments to translate economic interests and regulatory frameworks (Grundman). Both Haas and Grundman therefore, "neglect complex combinations of

[11] Epistemic communities may also be understood in one sense as an interpretive community or a community of meaning, following Yanow (2007). She also considers these as a discourse community or a community of practice.

[12] In some ways, members of the epistemic community resemble technocrats, not by their location within the bureaucracy (which sets them apart) but by characteristics in which they can traverse political boundaries and have no specific programme but are defined by a way of doing things. They are almost self-contained anti-politics machines, working through certain assumptions, providing supposed apolitical perspective but end up playing important political function.

internal and external processes that shape the knowledge construct emerging from scientific advisory committees" (Jansen & Roquas 2005, p.144). This is where their 'third categorisation' of epistemic communities comes into play, acknowledging both cognitive and social—including that of political-shaping—interests.

Notably, scientific advisory committees exist not because of their scientific value but because of their political and regulatory value. They legitimise political decisions because of their supposedly 'value neutral truth' (and where knowledge becomes a political resource (e.g. Richardson 2006)). Similar to the proposals of science and technology studies, epistemic communities do not operate in closed systems of science but in open systems; the 'messy' world. These communities also differ from political or social groups in terms of their internal hierarchies, arguments that count, discursive styles that are accepted and the ways values and interests are recognised. The 'not-pure-science' and 'not-pure-politics' character of ECs makes them an institution in itself, continually exploring and balancing the tensions and boundaries between science and policy.

While there is much to agree with from Jansen and Roquos (2005),[13] they also make a selective reading of Grundman's critique. His arguments actually follow closely with some of theirs and resonate with the overarching analysis of this thesis. The point is that Haas (1992) suggests too much of the consensus-building ability of epistemic communities in international regimes for four reasons:

i. policymakers actually do not necessarily turn to specialists to ameliorate uncertainties;
ii. policymakers rarely act on the consensus view held by specialists;
iii. consensus might actually never be reached, which aggravates controversy; and,
iv. epistemic communities might emerge before decision-makers realise there are problems with uncertainties.

[13] The actual argument the authors make is that within epistemic communities, efforts to establish meaningful understandings of local contexts fail not (only) because expertise may be missing but expertise occurs in the form of stand-in, detached advice that they call 'absentee expertise" (the idea seems to reflect the difference between tacit and explicit knowledge proposed by Polyani (1958) in which stand in experts may have explicit knowledge but lack the tacit knowledge others may have),

So contrary to Jansen and Roquos (2005), Grundman (1996) does in fact acknowledge the epistemic community's role as part of a wider network of legitimisation (similar to advocacy coalitions) and require the sanction of power. These appear to reflect the 'messy world' Jansen and Roquos (2005) consider, although Grundman (1996) is taking consensus building and decision-making as his point of departure rather than dwelling solely on the causality or sole importance of epistemic communities. Furthermore, Grundman (1996) does not "deny the centrality of the cognitive element" but suggests that it may lose its privileged role as an authority to which policymakers would turn (especially when the science itself is in a state of controversy not consistency). In doing so, there are still symbolic resources that ECs bring to bear on the process, in the form of principles, ways of framing problems, and providing certain solutions. In relation to earlier discussion, there is obvious overlap here too with Mosse (2004; 2005), who speaks of a 'process' of legitimisation rather than separating science and political legitimacy (see also Leach *et al*. 2005). He also notes the importance of actively constructing discourses and narratives rather than being passive recipients (drawing on Latour (1996) and similar to structuration theories noted above). Similar issues are witnessed when one moves from the international realms to local ones, from regimes to bureaucracies.

Technocracy

The policy process is deeply embedded in the modern exercise of rational authority and its legitimisation (Weber & Parsons 2012)—it is politically important that decisions are seen to be founded in accurate rational processes. It is within the realms of technocracy in which evidence-based policy and the scientific basis of policy finds its niche, if not providing a meta-political project at the forefront of decision-making. By this, there is always the concern that technocracy has anti-political (Du Toit 2012) and undemocratic (Fischer 1990) implications.[14]

[14] Though such views need to be contrasted with others that suggest that, despite politics becoming increasingly apolitical through expertise, increasingly, public and lay participation are playing important roles not only in manufacturing knowledge but being embedded within a rising tide of a public politics of participation, citizen science, and deliberation (Carter, 2013).

Technocracy is defined as a union between science and politics (Fischer 1990) in which science, or rather the scientist, acquires a privileged position in the political and policymaking sphere. The way in which technocracy plays itself out, however, contextualises to some degree the tension encountered when politics meets science and evidence as STS theorists suggest. Jenkins (2007) highlights that the intersection between politics and policy largely refutes the technocratic illusion that rational policymaking derived from objective knowledge somehow occurs above interests and ideologies. It is just that - an illusion!

Kirkpatrick (2008, p.151) provides a useful definition of technocracy from critical perspectives and alleges "that modern societies have allowed an increasing number of their operations to be taken over, if not by actual technologies then by agencies charged with providing solutions that are defined technically, as an alternative to those that are reached deliberatively". Fischer (1990) argues further that "technocratic theory and practices are largely shaped at the level of the organisation and that much of post-industrial politics can be understood as an attempt to extend such technocratic managerial practices to the state" (*ibid.* 1990, p. 14). In many ways, technocracy resembles a continued foray into the rationalisation of government through bureaucratic lines, as highlighted by Max Weber. Weber suggests that rationalisation —the development of science, modern technology and bureaucracy— is the organisation of social and economic life according to the principles of efficiency and on the basis of technical knowledge (Weber & Parsons 2003).

If bureaucracy and technical knowledge are symbolic of rationalisation, technocracy reflects their combination and the elevation of technical knowledge over and above others. There is a distinction implicit by this, in that technocrats are, at least in principle, distinct from bureaucrats (and 'econocrats') through their predominant problem-solving approaches, which in turn are derived from technical training. They thus perceive many important societal problems as being solvable, often while proposing technology-focused solutions. The technocratic "emphasis on rational coordination of institutional processes to the functional requirements of the productive system, gives rise to a uniquely administrative or managerial conception of the state" (Fischer 1990, p.25). Governments' operations have thus increasingly

moved towards complex bureaucracies to aid and deliver on decision-making processes. In South Africa, the move towards New Public Management during the Mbeki era is representative of such principles. In practice, however, and not surprisingly, South Africa's administration poorly reflects the aspirations of the hypothetical techno-corporate government described by Fischer, which invites a powerful political ideology to reshape the governance sphere along the lines of corporate liberalism. The idea of a 'techno-corporate model' of governance is used here purely as one model of how technocracy may fit into the wider governance structure. Techno-corporate government can be understood in terms of three spheres:

- a top echelon of political and economic elites
- a technocratic strata of experts and specialised administrators (identified as the technostructure), and
- a largely depoliticised mass public (Fischer (1990) citing Habermas's 'scientisation' of politics and public opinion).

It is the politics and search for allegiances between the technostructure and the elites—the politics of expertise—that becomes of importance in the case of biofuels. As I will show, the final decisions in South Africa did not reflect anything like what technocrats would want (except perhaps in the long run but that is a separate discussion and a politics-of-expertise debate should certainly be explored by further research). Such a situation reconfigures the value technocrats played in the policy development and the operations of the political elites rejecting the needs and advice of the 'experts' (although largely conforming to their rationales … that meaning the biofuels strategy remains locked into specific discourses and narratives and 'ways of doing things').

At the same time, as these operations occur within wider governance frameworks—that is operations beyond the confines of government and increasingly involvement of non-state actors—experts increasingly come from sectors beyond government departments. Therefore, technocracy has to be seen not only as a strictly bureaucratic process as outlined by the likes of Weber but incorporates a general movement towards expert advice within the nexus between government, civil society and the private sector (and hence also the rise of epistemic communities). Within this idealised relationship, preference is given to a special branch of technocratic

scientists and experts (though see Scoones 2012 for a pithy critique of the UK situation). While the role of scientist and advisor has been discussed above, technocracy involves an appreciation or model of knowledge and knowledge generation processes specific to public administrations, in which there remains the pervasive assumption that such processes are value-free and objective. Teik (2010, p.2) dispels the neutral nature of technocrats and states:

> [t]echnocracy often holds out the promise of rational, disinterested decision making. Yet states look to technocracy not just for expert inputs and calculated outcomes but also to embed the exercise of power in many agendas, policies and programs. Thus, technocracy operates as an appendage of politically constructed structures and configurations of power, and highly placed technocrats cannot be 'mere' backroom experts who supply disinterested rational-technical solutions in economic planning, resource allocation and social distribution, which are inherently political.

Teik (2010) argues that politics and technocracy enjoy a symbiotic relationship. Political organisation, in the form of states and regimes, requires technocracy to guide complex policy formation and render the policy choices credible with their expert knowledge (hence the politics of expertise). Technocrats need politics, that is, the sanction of power, to be heeded and to have a powerful claim to the resources in their fields (Hart and Victor 1993, Teik 2010). In the same way, the South African administration departs from an idealised technostructure (above) it is the symbiosis between politicians and technocrats described by Teik that I contend adequately, but only in contrast, describes the South African biofuels policy development. When technocrats do not have the sanction of power, that is they have no support, their proposals are considered 'failures'. Although, this too is only one construction of failure and does not necessarily mean there is still no future for, in South Africa's case, biofuels; support still exists and networks are clearly more complex and beyond merely the 'political' and technocratic. Of course, it may also be simply stated that technocracy is merely a form of politics but working under the guise of value-free rational decision-making.

THE FEASIBILITY STUDY AND EVIDENCE GATHERING IN THE SOUTH AFRICAN BIOFUELS POLICY

The Biofuel Task Team was established to oversee a policy process that would be technocratic and evidence-based in its early phases. (It would follow a degree of

public consultation thereafter, a topic I delve into later on.) A 'Feasibility Study', entitled "An Investigation into the Feasibility of Establishing a Biofuels Industry in the Republic of South Africa" (Biofuels Task Team 2006), was initiated to determine the issues that would justify the creation of the biofuels industry, such as environmental benefits, supply security and job creation by examining what a South African biofuels industry could look like. The approach was one of comparing South Africa 'with and without' a biofuels industry. This, according to the Feasibility Study's *Executive Summary*, must form the basis of an Industrial Biofuel Strategy (Biofuels Task Team 2006).

The previous discussion suggests that evidence and the process through which it is created are both subject to their own internal logics and biases. Similarly, whereas evidence might be useful in decision-making, policy is cultural, which Kirkpatrick (2008) defines as the realm of meaning, and thus, evidence is better viewed as only one aspect of the meaning-making process. Evidence, after all, may be used in ways different to that intended by so-called advisors (Hill, 2005; Hodgson and Irving, 2007b). It is here then that unpacking the process of policy-making becomes so important, and it is by referring (perhaps too loosely) to the Feasibility Study as a rational or scientific endeavour that the above discussion of STS becomes relevant, though as we shall see may be overly ambitious. Its use as 'evidence', however, should not be neglected. How the Feasibility Study actually achieves its goal—forming the basis for the strategy—has been scrutinised to some degree in the consultation phases when the *draft* Strategy was released. The next sections give such criticisms further attention reflecting also on the Feasibility Study's position in the broader policy development and as a function of its own logics and biases.

It is first necessary to reflect that the industrial rationale had been well established by the start of the Feasibility Study. The questions were not the type of approach to be followed but what differences the biofuels industry (imagined, one could suggest, to match that of countries such as Brazil, Germany or the United States of America) would make to South Africa.[15] Reinforcing such a rational, the Feasibility Study would be overseen by the Central Energy Fund (CEF) and the Industrial

[15] According to internal document of the Central Energy Fund, (2006).

Development Corporation (IDC), who had a direct interest in large-scale biofuels development. There is a discernible conflict of interest here,[16] given that while the CEF enrolled the consultant to undertake the Feasibility Study, it also had an investing interest within a range of projects being proposed at the time (Cf. African Centre for Biosafety 2008). By enrolment, I mean that the CEF and the IDC were in control of the Feasibility Study—its Terms of Reference were entitled "Joint Study for CEF (Pty) Ltd and Industrial Development Corporation (IDC): An investigation into the feasibility of establishing a Bio Fuels industry in the Republic of South Africa"—who then brought on further expertise. The final version of the study merely excludes the CEF and IDC in its title. Their interest in biofuel projects emanates from progress reports from the CEF itself suggesting that, while it appointed consultants who were then housed within their offices and working on consolidating information for the strategy, they were also (at least planning on) investing in at least six large-scale projects proposed in South Africa (internal document of the CEF, 2006). This also necessitated the extensive financial support needed from government. As one BTT member criticised:

> *in the BTT it turned out that CEF had already lined up projects and they were waiting for subsidies* (Former BTT member A, 2012).

As the 'implementation arm' of the Department of Energy, the latter is perhaps justifiable but by the former, the CEF becomes somewhat of a 'player and referee'. It should be noted that there was the additional oversight of the BTT, to whom the consultant and CEF/IDC reported, however, as the only consultants carrying out this type of Feasibility Study there is significant control over framing the process to be taken. (Much to the distress of these and other early biofuels advocates would come with the realisation that even the BTT was not the only referee and while they would

[16] It is perhaps better to avoid such imposing terms as 'conflict of interest'. In theory the policy process would be one in which such conflicts of interest are ironed out through the political process and through the work of the Biofuels Task Team. The more important issue is that even though the CEF and IDC, as project managers for forthcoming projects, would have the expertise to undertake such studies, their involvement in the BTT and so centrally with decision-making (with implications for the direction research and development might take) does make unclear as to how neutral any of the processes can claim to be. This is unfortunately not a unique situation. As Bond and Ndlovu (2010) highlight for the Coega 'mega-project' Aluminium smelter, conflicts of interest for key decision-makers clouded its image of good governance. Like Coega, biofuels projects in the Eastern Cape seem to have drawn on investment funds from the controversial arms deal as well (see Chapter 4).

take what the Feasibility Study said as a basis for the strategy subject to internal oversight, Cabinet still had the final judgement (see next chapter).) That presents a question of what the Feasibility Study actually said and whether this would match the needs of the BTT and the 'political' oversight, or if it did not, what it might mean for such oversight.

Terms of Reference: Contracts or Scripts for the Evidence-making Process?

A first point of departure in the evidence gathering phases is to unpack the original Terms of Reference that directed the appointed consultants. If considering the credibility of the feasibility report is critical, the guiding premises are of obvious importance as these determine to what the degree 'the science' or investigation is circumscribed by initial (and potentially non-scientific) aspirations. A copy of these Terms of Reference (dated 31st May 2006) highlights a two-fold process and requisite outputs. The first would be a review of existing knowledge around biofuels and identifying relevant 'gaps' in the literature. The second was a more in-depth process that would consider the legal, policy and regulatory environment; economic and social fundamentals; energy balance; refinery depot and logistics; agriculture; feedstock; land and water resources; trade issues; consumer education; environmental considerations; risk and risk mitigation and finally some 'general' issues such as technologies, international trends, and standards amongst others. Although a robust set of parameters, perhaps the most noticeable constraint is that all this was to be achieved in three months. As the response to the terms of reference described below declares (Austin 2006, p.3):

> [i]t will be very difficult to do this in a rigorous manner in under three months, hence I trust there is a large enough team with sufficient time on their hands to make this a worthwhile exercise.

The Terms of Reference (ToR) document actually stipulates a period from June to October—slightly longer than the three months—but importantly, there were two phases and the evidence gathering stage, arguably the more difficult, was what would have to be completed in such a short time frame. Raoul Goosen, the lead consultant working with the IDC and CEF describes it as "a mad rush like usual".

While the short time frame is problematic, such a circumstance is not unheard of as decision-makers and government officials often work under significant time constraints. A fundamental issue here is whether any of these questions could be answered rigorously in any specific timeframe, or at least in a longer timeframe. The answer is both *yes* and *no* (or perhaps *if* and *maybe*), and is probably why suggestions from the feasibility appear so indeterminate (see below; though this is not the only reason). The issues entertained within the list of requirements noted above touch on some exceptionally complicated scientific problems. Take, for example, energy balances and environmental issues (which are considered here to include at least, issues of climate change given its pre-eminence in existing political and scientific debates). The science of both of these is by no means one of consensus, and that is from an international perspective rather than taking into consideration contextual and ideally far more in depth studies yet to be undertaken for the South African case. Smith (2012, p.41) sums the situation up as thus:

> [n]eedless to say, arriving at an analysis that is both accurate and of use to policy-makers is exceedingly difficult. Technically, there are limitations and trade-offs between accuracy and accessibility in analysing the true environmental costs of biofuel production. Scientifically, we may simply not have the knowledge or the data we need to fully realise a workable analysis.

In following, Smith (2012) describes challenges in boundary settings; how these may be drawn when undertaking life cycle analyses; the difficulty in modelling complex systems (and ensuring methodological consistency when doing so); dealing with uncertainty (in data and change over time) and flawed analysis of energy returns, which are realistically the culmination of all of the above too but also an outcome of potential biases on the part of the scientists themselves. Similar arguments can be made for reduced carbon emissions and climate change reduction (see for example Searchinger *et al.* 2009).

There is more to glean from the Terms of Reference than a robust set of parameters and the inability for them to be adequately researched. Reflecting the shifting proclivities of the Biofuels Task Team described in the previous chapter, the Terms of Reference reflect a narrowing of scope, aimed towards an E10 and B5 to B100 blending of bioethanol and biodiesel respectively (Anon 2006b, p.1). The issue at stake is that establishing a biofuels industry, which could be read more to mean a

bio-energy industry in the country is condemned to include only the two transport fuels. As the only feasibility study being undertaken for the strategy's development, this leaves out numerous potentially viable, politically acceptable and identifiable industries. It is, however, logically consistent with the internal thinking of the BTT, who for the most part were leaning in such directions anyway and had specific reasons for the industrial focus (see Chapter 5). There is also some overconfidence on behalf of the IDC and the CEF, in which they highlight (Anon 2006b, p. 2):

> [t]he report is intended to provide a macro perspective to further assess the desirability proceeding with the projects identified by the CEF and IDC. The findings will also contribute to government strategy position on bio fuels.

The underlying motivations of the ToR seem skewed towards establishing the better path for the CEF and IDC, with subsidiary benefits of perhaps teasing out some strategic direction for the policymakers too. This is not ideal as a 'basis for the strategy' being developed, despite the strategy documents and the political appointment of the BTT suggesting this was its original purpose.

The Terms of Reference were subjected to independent review exposing a number of shortcomings (that would need) to be addressed before commencing the study according to Greg Austin, who reviewed them (Austin 2006). Important issues raised included, *inter alia*, expanded sustainability criteria to include a diversity of energy sources derived from biomass, a range of timeframes for developing the biofuels sector, sustainable production systems and calculating externalities (*ibid.*, p.4); energy efficiency considerations along the entire value chain, as well as life cycle analyses rather than carbon emissions only (p.5&6); centralised agro-industrial approaches meaning limited opportunities for rural development (p.3); the neglected potential for decentralised approaches incorporating local Small Medium and Micro Enterprises (p.4); and the need for job creation by establishing links to small-scale farmers and throughout the biofuels value chain. Questions were also directed towards how the steering committee would be selected and any disputes resolved.

Another point of clarity Austin (2006) considers is what the overall scope of the strategy was exactly. Not only was it uncertain whether the biofuels strategy being formulated was supposed to be *the* biofuels strategy or part of a wider bioenergy

strategy (as mentioned above), there appeared no real objectives or goals (job creation, environmental sustainability, fuel security) that were to be optimised through the Feasibility Study. In his review then, Austin (2006) had pre-empted or begun to touch on the narrow scope we have seen emerging from the early processes discussed in Chapter 5. The review of the ToR then turns to a range of specific issues to be dealt with; however, many of these do not appear to have been considered in the final version of the Feasibility Study. The content of these is less important (see below) than the fact that by neglecting further discussion, the Feasibility Study discounts a necessary rigour for such an analysis to be considered expert or scientific; yet it was still acceptable as evidence in the broader process.

If one considers the review of the ToR, it brings into light expert controversy in the early stages. If science were given the space to work towards some kind of consensus (or contest), there would need to be an exchange in which argument and counter argument are established, debated and agreed or disagreed (probably the latter). However, the fact that there was no further engagement on the Terms of Reference, following Austin's initial review, closes off such a process entirely and begins to suggest that, even before we question the evidence, the ostensibly technocratic policy process has to some degree already fallen foul of the requirement of impartiality. At the very least, there is an increased likelihood that the evidence produced is more biased than would normally be associated with scientific evidence gathering. This is important as biases, acting through the terms of reference, set the tone of the investigation that would follow. One could also argue that the Feasibility Study itself is not scientific, which in itself is not problematic until one considers that the credibility of the study is based on the rigour of science when gathering the evidence. It also reflects challenges outlined in the theoretical discussion in which gathering the evidence itself is subject to a range of its own internal shortcomings. It is useful then to interrogate what evidence was actually produced.

What Evidence?

The Feasibility Study is more a modelling exercise focussed significantly, but not entirely, on the financial feasibility of biofuels. To review its content I draw from the critique undertaken by the African Sustainable Fuels Centre (ASFC). The ASFC

provides a concise critical appraisal of the Feasibility Study. While the Feasibility Study justifies an industrial biofuels development given the financial feasibility, there are some major contradictions and there is a strong need to assess the social and environmental costs of such development (McDaid, 2007). My reading of the Feasibility Study also raises some important contradictions between the early jobs and rural development narratives and the actual potential of these to be realised through the strategy, which I discuss later.

The ASFC takes as a basis for their critique the objectives of the Feasibility Study, which sought to determine three things, by answering the following questions:

i. Is a biofuels industry in South Africa justified?
ii. If so, what magnitude and nature is optimum?
iii. What incentives and regulatory environment is needed to create this optimum size industry, and in an optimum manner?

In the Feasibility Study, the justification of a biofuels industry is answered *after* the optimum magnitude and nature are covered in economic terms (as part of a methodological discussion) in the first section of the Study. Despite proposing a triple bottom line, the social and environmental issues would be applied after the financial models have been developed. The implied assumption is that the environmental and social outcomes will not have an impact on the financial model and are therefore externalities that might be mitigated separately. By raising such criticism, the ASFC questions the economic logic of externalities calling for a broader view from outside such economic fundamentals. Without venturing into value judgments or economic debates around externalities—largely revolving around differences between private and public goods and distributive benefits accrued from/through each—the importance here is to suggest that such principles are wedded to policymaking in extremely early phases of the decision-making process. It suggests a naturalised order of things; first make sure that it makes economic sense, if it does not, do not proceed (or figure out ways to make it make sense), if it does, then look at the potential damages caused. (This order of things is, however, quite

open to change of course, as later proposals of linking the first and second economy (which is financially intractable) suggests.)

The ASFC then critically assesses the six arguments the Feasibility Study puts forward as a justification for a biofuels industry. These include:

i. Meeting the rural energy target: the weakness of this section of the Feasibility Study, is that it focuses not on why biofuels is a good method of meeting the renewable energy targets (as opposed to other approaches that would not require the agricultural sacrifices) but rather details how biofuels should be supported.

ii. Energy Security: here the feasibility recognises the blending ratios proposed make little contribution to overall energy security.

iii. Agricultural support and development: it is acknowledged in the Feasibility Study that agricultural support emerges as the primary driver of biofuels assistance in all cases and that being reliant on feedstock, agricultural subsidies and incentives are a necessary element to any biofuels strategy. Whether the subsidisation of the costs of agricultural development via biofuels is more efficient than alternatives is not clarified.

iv. Jobs: the need to create jobs and rural development is spuriously based on factors that could undermine sustainable development. While the feasibility suggests the need to establish the cost of creating jobs in the biofuel sector compared to alternatives, it does not do so [except in comparison with those within the petrochemical industry].

v. Emerging farmers and SMMEs: This section poses the question of the extent to which a displacement of crude oil refined products can create opportunities and jobs for SMME's and, as ninety per cent of the jobs for biofuels are located in the agricultural sector, for emerging farmers in particular. It provides no answers.

vi. Second economy: this section poses the question "whether biofuels will help shift emerging farmers from a subsistence existence to commercial production" but provides no answers. [There is, however, explicit mention later that the second economy is unlikely to benefit from the

industrial biofuels strategy, requiring a separate strategy to be developed and highlighting a contradiction in the body of the report and its executive summary, and in relation to how it is used in the *draft* Strategy.]

In summary, of the six motivations put forward as justification, three have no answer, two state the biofuels will not make a significant contribution, and one is ambivalent, stating that a biofuels strategy could provide agricultural support but on the other hand, unsure if it should. The Feasibility Study, according to the ASFC, therefore fails to demonstrate the necessary justification for an industrial biofuels strategy. The study does, however, go on to look at a range of issues that might in some way respond to these unanswered questions, but not clearly. It begins to outline what kinds of support could be offered, but as only a Feasibility Study it does not make any prescriptions.

There is a question, however, as to whether the lack of information makes a strategy unjustified, or, whether one then needs to strategise based on the best available information to ensure a viable future. Whether this was achieved I will discuss later, certainly it seems to be the approach taken.

> *It's a feasibility, by the time you look for your strategic concerns you can expect a negative finding in the feasibility but if you unpack and understand it then you can determine how to work on it, it can become part of your strategy regardless if there was the problem or not. So I won't discount the value of CEFs contribution, that consultant did not report to CEF in synthesising all these reports, that consultant had to report to the Task Team on a regular basis while there was the interdepartmental strategy* (Former B-JIC member, 2012).

The credibility of the Feasibility Study is dubious and provides a relatively sketchy basis to work from but there are also deeper cracks in the overriding philosophy, which emerge if one goes further than the Executive Summary. The Feasibility Study actually discusses at some length the range of possibilities for conservation agriculture (no till, conservation agriculture, *et cetera*.) and environmental considerations that need to be considered but these are not considered in the *draft* or *final* Strategy. Such an inclusion in the feasibility comes as a surprise to any reader,

especially me, as I was accustomed to the far more industrial 'first economy' rationales of the strategy documents and the views of those interviewed. The latter issue was also not considered in detail by the ASFC, apart from acknowledging their support for such approaches. It was only in discussions with Annie Sugrue, an unlikely member[17] of the consultant team that one grasps the inclusion of such conflicting views. There was definitely a clash of ideologies taking place. Her main concerns was that this was not a programme that would be of benefit to smallholders (hence the first main contradiction mentioned above) and second, she included the section of ecological farming as she had concerns of the sustainability of the farming practices envisioned. Although being vocal about these issues, they did not fit with the general philosophy. The irony is that politicians angling for a 'jobs solution' meant that a strategy was produced for smallholders that could only work for commercial farmers; an argument I elaborate on in later chapters. The initial antagonism has been quietly forgotten after the Strategy was released and, it must be said, that the bias towards the second economy evident in the *draft* and *final* strategies does not emanate from these provocations in the feasibility but wider political discourses as discussed in the previous chapter. Any discontent or a continued debate was short lived as, once the Feasibility Study was produced the various consultants parted ways.

I take up the issue of the second economy later, for now the absence of sustainability issues from the strategy suggests there was little further consideration about who the farmers were going to be and the types of farming that would be used. Indeed, it is wondered by the consultant if that section of the Feasibility Study was even read at all let alone considered any further. The *Draft* Strategy (DME, 2006, p.7) states boldly that:

> it would not be prudent to drive [the biofuels initiative] without consideration of holistic sustainability benefits, at local, national, regional and global levels. The Feasibility Study underpinning this draft Strategy therefore included a holistic analysis, so that the draft Strategy proposed could take account of all factors and impacts.

[17] Being unlikely should not be suggested as being unqualified. As a researcher involved in the development of the Version Zero sustainability criteria her insights would be of obvious utility to ensuring sustainable approaches in the South African context.

That appears to be the extent of consideration given in the strategy, even though such issues were clearly not resolved in the feasibility. From the nature of the projects proposed (see Chapter 4), they also do not appear to be considered in practice either (though it could be argued that it is up to environmental legislation to ensure 'sustainability' at the project level, this is beside the point and perhaps over-ambitious). This focus on industrial agriculture is a useful lens through which one can highlight the nature of the objections and identify the meaning-making process the Feasibility Study and the subsequent *Draft* Strategy represents. The feasibility is rather strictly focussed on economic viability, using commercial production as a basis (despite raising environmental and social issues outside of this). Two main objections, amongst others, should then be raised. The first involves contextual aspects, for example the viability of pursuing commercial agriculture on new land, in the face of projections of increasingly destructive climate change (Jones & Thornton 2003; Lobell *et al*. 2008; Lobell *et al*. 2011), with water already a limited resource (Jewitt *et al*. 2009). Additionally, mechanised and large-scale farming is not necessarily environmentally and socially sustainable or even relevant for developing countries (Woods, 2006) but certainly requires greater scrutiny in the South African context. Apart from econometric criteria, there is no real sense of sustainability criteria established within the strategy. Not even the energy returns on energy invested, which would show whether it is worth pursuing biofuels in the first place are interrogated.[18] These are considered contextual as the degree to which they are affected by and impact on biofuels production depends on local contexts. No recommendations are provided as to how such contexts will be handled.

There is a lingering question as to why such an abstract feasibility becomes credible given the contextual requisites necessary to make decisions. The latter further suggests an institutional barrier in that national polices become abstract in their own right (if not out of necessity), which precludes any specifics or tailoring towards local contexts. This is a more practical limitation or outcome of institutional arrangements in the county. As the policymaking realm is at national level, policies are national in scope and bear very little resemblance to the heterogeneity such

[18] Although clearly if you are trying to maximize certain benefits, such as job creation, the logic of energy efficiency may not be as crucial; a sign of the prominence of ideology within strategy development (Cf. Makanete *et al.*, 2007).

policies are likely to encounter in their implementation. The latter is suggestive of an inadequate 'fit' (Cash *et al*. 2006; Young 2002; e.g. Ruysenaar 2009) between institutions and the socio-ecological systems they are meant to govern, yet consensus prevails. As Richard Rumelt (2011) makes clear, however, consensus, especially vague consensus can be a bad thing.

Evidence as Consensus Building

Although not providing perfect information, the importance of the Feasibility Study was not actually what it said specifically (although these are important in the emerging criticisms of the study itself)[19] but how it was used to validate specific policy narratives. It is here where pro-poor or developmental rhetoric becomes so important (again), even when such rhetoric contradicts the Feasibility Study pervasively. The Feasibility Study itself is actually largely devoid of suggesting any kind of pro-poor bias. In fact, despite acknowledging "[j]ob creation and upliftment of the so-called second economy are the prime benefits or objectives" (2006, p.1), the Feasibility Study goes on to state that there is little room for biofuels to link the first and second economy.

> This report's point of departure is therefore that a biofuel programme for the small-scale farming sector must differ from that devised for the larger commercial farms if it is to contribution to alleviate poverty and stimulate a rural local economy. In the short term, such a programme will unlikely bring about the merging of the first and second agricultural economies. For that, an intensive long-term intervention is required (Biofuels Task Team 2006, p.57).

Instead, as the above extract suggests, the Feasibility Study highlights that a different strategy will be needed for poverty relief and small-scale farmers than that devised for larger farms and that there were other benefits that were still important. Although some further attention is given towards opportunities for small-scale farmers, it amounts to about three pages of just over one hundred and it emanates from Annie Sugrue—the consultant who found herself part of a consulting team, although one of

[19] Although its findings did become crucial policy artefacts, by which the 55,000 jobs that it *predicted* would be created (for both an E10 and B2 combined) or the 50,000 for an (E10) has become synonymous with the biofuels industry in other reports (e.g. Maia *et al.* 2011) and popular discourse (e.g. Prinsloo 2011) but the f*inal* Strategy actually halves this (as it did the proposed fuel mix) to 25,000 jobs.

very different background to the others. It is for this reason revealing that in the *draft* Strategy, the same motivation, transformation and linking the two economies is mooted as one of the objectives,[20] despite maintaining the same rationale and biases of the Feasibility Study.

The *draft* Strategy considers for example:

> [the] biofuels industry, being agri-based, is low technology and job intensive, which suits participation by the 2nd economy … The intention is to have as light handed a government approach as possible, with regulatory and incentive interventions to a minimum and decreasing over time. However, where there are market failures, in particular to establish the infant biofuels industry, government will regulate as is necessary (DME, 2006, p. 9).

The Feasibility Study allows some credibility to such pronouncements made in the strategy document not by what it says but by it being undertaken. Of course, one could argue that even subscribing to the idea of a first and second economy hides important cleavages and historical dynamics that have resulted in the rich minority (first economy) and poor majority (second economy) or poor black farmers versus rich white ones (see Chapter 3), but also shows how the metaphor of the two economies neglects the complex historical linkages between the two. Similarly, food is produced in the Free State and sold to the former Transkei (in the Eastern Cape) because there is requisite infrastructure is in the Free State – and yet the Transkei has some of the most fertile land. This is a structural issue and resembles old power structures not technical issues of soil fertility. This means there is a need for higher order planning that acknowledges the historical processes through which current markets have developed, and where necessary replicate or remediate. To simply 'bridge' the first and second economy utilising biofuels as a techno-solution will not achieve the transformation of the rural economy, it might allow for some form of transition of one form of agriculture (traditional/small-scale) to another (large-scale) but there is no guarantee that this will have the 'developmental' benefits deemed

[20] When considering objectives in the *draft* Strategy, it is stated that (BTT, 2006, p6-7) "[g]overnments typically have many policy objectives that are pursued concurrently and consequently any new intervention runs the risk of being diffused and lost among the myriad competing policies. This is especially the case with renewable energy interventions that may meet many varied objectives." It seems here that the strategy itself has fallen victim to this by maintaining its developmental stance when the objectives deemed achievable within the Feasibility Study contradict such a notion.

important. At the same time, as easy as it is to criticise obvious contradictions, no-one has suggested that there is an automatic acceptance of the two-economies rhetoric in the biofuels debate, in which biofuels 'cannot link the two' (according to the Feasibility Study) and will link the two (according to the *draft* Strategy). On the one hand, the techno-industrial rationales of the Feasibility Study clearly 'others' what may be regarded as the second economy. On the other hand, the prevailing political aspirations make the second economy central to the strategy but erroneously based on what is feasible in the first economy. Neither perspective considers whether the promotion of two economies or the emerging biofuel discourse is based on spurious logics in the first place.

A final issue of the Feasibility Study as consensus building, that has been implicit in the differing perspectives of the team members, is whom it brings together. Following on from Austin's quotation above, whether the team was large enough is a moot point now. Ultimately, it probably was not but it would be difficult to suggest an optimum size regardless. However, there was an interesting composition emerging in which the IDC and CEF had had an offer from ABSA to assist with the process, and also included a range of other financial and industrial specialists (particularly with links to Sasol) as well as some academics from Stellenbosch University, Pretoria University and the FAPRI team (described in the next chapter). While in a meeting with Raoul Goosen—the lead consultant on the Feasibility Study—it was fitting that he was able to point out some of the other members of the research team undertaking the feasibility as they made their way down the corridors at the IDC. The way he saw it—and from meetings from former ABSA representatives he is accurate—ABSA had a lot of debt in the agricultural sector and had a vested interest in considering the value of biofuels to maize farming in the country. These perspectives merged nicely with the thinking of the IDC as an emerging entrant into the biofuels industry on the technology side.

I have encountered varied criticisms that the experts were all like-minded specialists from the oil industry or agribusiness. Apart from Annie Sugrue, there is probably some truth to the perception, given the experts and their affiliations noted above. This team had significant influence in conceptualising how the country would

proceed with biofuels in very specific ways.[21] This group informed the growing imaginary surrounding biofuels in which advocates set out a trajectory for agrofuels; that is agrofuels within the confines of the MEC and existing fuel architectures and paralleled by support from agribusiness and their counterpart industrial farmers. This should not be taken to mean that there were no internal arguments and that some were not disillusioned. Not even ABSA necessarily endorsed the findings of the feasibility. It seems they too had their objections to what was produced, though these became more acute once the strategy was released. As a former ABSA member bemoaned:

> *We were trying to get some good work done, using private money to fund public research and they gave us the middle finger… Real research was done, not like government does; we had something substantial!* (Consultant C, 2010).

CONCLUDING DISCUSSION: FROM EVIDENCE-BASED POLICY TO GOVERNING SCIENCE AND TECHNOLOGY

This chapter began with a theoretical discussion about the use of scientific knowledge in the policy process. The proposal is that science, almost counter-intuitively, does not inform policy in ways one would assume. Social science and scientific knowledge are in fact problematic; they are neither absolutely objective nor are they necessarily amenable to solving policy problems. The same can be said more generally of evidence, if not more so. For one, evidence may be imperfect and depart from the rigours of 'science' (experience and the lay public may also be important sources of evidence) but still be legitimised based on presumptions of positivistic and objective knowledge. These dynamics can clearly be seen in the evidence-making processes of the biofuels strategy. The modelling of the Feasibility itself, while represented as best practices, does not examine the full extent of the complexities involved in biofuels and, where alternative approaches are considered necessary, these are marginalised and left unattended. Granted, it is questionable

[21] Even I had become guilty of talking about biofuels according to its conceptualisation within the strategy. This dawned on me when meeting with a consultant from the USA, who was reluctant to use the words biofuels in such specific ways and that he had continually had to classify what he considered biofuels when discussing them. He took on a far more diverse bioenergy perspective and considered a range of fuels incorporated within this overarching category. He was always surprised how the South African policymakers had always used the term so myopically.

whether it is possible to acquire sufficient information around certain risks and complexities of biofuels (e.g. Smith 2010) and, as only a general Feasibility Study or modelling, a partial examination of technicalities is perhaps admissible. One of the BTT members levelled an extreme criticism pointing towards the circumspect evidence provided:

> *there was no real science involved and that if you talk to … in South Africa … the community of scientists in water and wood and all those guys, they think biofuels is completely rubbish. So, I think you shouldn't underestimate that there is a big body of intellectuals, or claimed intellectuals, who think biofuels is horseshit, because they know better* (Former BTT Chairperson B, 2010).

His criticism was twofold. First, he reiterated the first conclusion above in that the evidence was clearly inadequate and unscientific, even though it was presented as rigorous and objective. Second, it suggests that only certain perspectives were of value to the Feasibility Study (with limited space for counter evidence). This matches with a second conclusion, which, drawing from STS perspectives, shows that it is the networks and social construction of evidence that gives it a perceived truth-value and in so doing legitimises its passage into the policy sphere. Such a process insists we need to look at who produces knowledge and how they come to be legitimate providers of such knowledge but also who the gatekeepers are. In the case of the Feasibility Study, it is important to first note that this was a study undertaken for the CEF and IDC as much as it was a study undertaken for the Biofuels Task Team and developing of the strategy. It was a technical review, constructed to fit within an overriding and preconceived terms of reference (which were also shown to be inadequate) and was handled by experts from the fuel industry, supported by major investors in agriculture and investors in large-scale projects, all of whom were either part of or had close links to the BTT. (To some, the BTT was perceived to be made up of bureaucrats with little understanding of the complexity involved in biofuels and thus required expert advice). Little wonder the study comes out in support of a 'biofueled' future based on large-scale commercial agriculture and industrial-scale production.

Being the basis for the Strategy, the feasibility provides a very shaky foundation but does open up the possibility of providing a legitimising or symbolic basis giving the resulting strategy a perceived credibility. As the BTT, who would draft the strategy, had accepted the Feasibility Study as credible, the two were legitimised by one another. There is little chance that the BTT would reject the feasibility, as it was part of their imaginary, created not external to but within their confines. What has been produced then as a strategy document is based largely on the meanings ascribed to certain elements of the Feasibility Study. There is very little tackling of the difficult issues but rather a focus on those that allowed shared meaning and consensus, however thin that consensus was. This is not policy-based evidence gathering, it is policy-based evidence co-production. That is, policy and evidence are both co-produced and, are themselves socially constructed; they are shaped by the larger situation in which they rest, as Jansen and Roquas (2005) suggest in their review of epistemic communities.

The latter raises a further conclusion that is perhaps outside of the research findings but an important consideration from a policymaking and governance perspective. The thrust of this chapter has been towards the use of scientific knowledge in policymaking and the challenges and complexity thereof. From another perspective, one should also think about the governance of science and technology, indeed recognising it as something that needs governing. This seems to be especially important in complex case like biofuels and in a country like South Africa where the state's ability to govern complexity faces its own challenges. Science and technology within decision-making needs to be underpinned by a decision-making apparatus that shapes that science and technology in the first place otherwise it ends up simply being reactive and not strategic.[22] Of course, one could argue that this has been the case for the biofuels strategy, the point is asking who (or what) does the shaping, or better yet framing and how it changes with political oversight. With this in mind, the next chapter will look at how the policy has been reshaped and how such knowledge might not be as important in policy as we think anyway.

[22] Expressed in a somewhat different way, we need to question whether it is science and technology doing the governing or being governed.

CHAPTER 7: MOVING BEYOND THE RATIONAL – POLITICS AND THE RE-FRAMING OF THE BIOFUELS INDUSTRIAL STRATEGY

In the previous chapters, the origins of the biofuels strategy and the prevailing logic of the feasibility were scrutinised. In so doing I have also begun to highlight some of the major stakeholders—those who 'hold the power'—involved in the early processes. Whereas policymaking in these early stages was confined to close networks surrounding the Biofuels Task Team, the phases discussed next see the onset of a far wider array of actors, with vastly different prerogatives, which would also shift as new political challenges came to the fore. In this chapter, I will continue to map the policy's development, analysing some of the significant changes that occurred and highlighting the shifts that occurred between the publishing of the (highly criticised) *draft* Strategy and its (business-unfriendly) final version. Most commentators consider these shifts being to both the strategy's and the industry's detriment.

To begin, I first depart from the general empirical narrative and review two existing analyses of the strategy's development. The point is not that the existing reviews are incorrect, as they have important findings, but that they do not go far enough in examining the nature of policymaking beyond somewhat narrow economic or rationalist conceptions or a strict positivistic orthodoxy. For this reason, I will present a summary of the two major works delving into the strategy's development and then follow this up with a summary of my findings from interviews with key informants involved in the process, contrasting some of the previous findings but also bolstering many of them. In essence, the approach continues the overall problematisation of the policy process, by interrogating not only what was said but questioning why such sayings are considered 'normal'. The critique is thus not only that of the 'objective' nature of the existing reviews but the rhetoric of the strategy and the negotiations through which it was constructed.

One of the most dramatic shifts during the consultation phases- between the *draft* Strategy and its final version was that of the food-versus-fuel debate. A significant portion of the chapter will also be devoted to this debate as it reinforces or

substantiates the limitations of purely 'economistic' perspectives mentioned before. The food-versus-fuel debate is important for two other reasons. First, it further documents shifting power structures and underlying narratives and discourses within the policy process and somewhat represents the dismantling of the maize lobby and its supporters (although this is not the only reason for their 'disbanding' or the last we will hear of them).[1] More so, tracing the food-versus-fuel debate allows one to uncover and interrogate what was considered purely political forces that have had the final say on the matter. That it was a political decision is certain, as I will show, however, the motivations behind such decisions need greater inspection, whilst some remain hidden if not invisible. Additionally, there is room to step back and reflect on what these political decisions suggest of policymaking processes in general, as I will do in the concluding section of this chapter.

EXISTING REVIEWS: GAME-THEORETIC MODELS AND MARKET SUPREMACY IN FINALISING THE BISSA

Two major works have already begun to unpack the development of the strategy. The first is a Doctoral thesis using Game Theory to model the process, showing what should have happened as opposed to what actually did, and provide remedial recommendations to the impasse (Funke 2010). The second is an econometric review by the Johns Hopkins University that sought to research the potential impacts (or lost opportunities) of the strategy on the rural poor (Adams *et al*. 2009).

[1] See Chapter 4 for a discussion of the maize-to-ethanol projects and their demise after government passed the *final Strategy*. Essentially, industry players who were bargaining on greater support from government— in terms of incentives and mandated blending—constructed the failure. When these pre-requisites were excluded in the strategy, most projects became unviable. One of the first projects—now known as Mabele Fuels—has, however, slowly being lobbying government and continuing with their plans and appears set to be one of the major biofuels producers in South Africa, when the remaining issues of the strategy are sorted out (Brouwer, 2011, *Pers. Comm*.). That the maize lobby respondents have generally referred to this as a 'policy failure' is largely a construction, given that they had foreseen something different to what happened and that support for them within the policy was withdrawn. There was no reason 'strictly' speaking that government had to provide such incentives, and according to some Task Team members could not afford to anyway. The fact that large sums of money were lost by these early investors illustrates the importance of policy itself, and the way in which abstract and rhetorical judgments have very real implications; but there are no guarantees. It does not mean that the policy failed for everyone, but that rather failure is relative.

Playing Games in the Development of the Biofuels Industrial Strategy

Thomas Funke was a student at the University of Pretoria, working closely with the Bureau for Food and Agricultural Policy (BFAP). His Doctoral thesis in Agricultural Economics forms part of a wider modelling process undertaken by the BFAP, which is probably the most comprehensive modelling of the agricultural sector commodities (BFAP, 2012, 2010, e.g. BFAP 2006) and the potential influence of biofuels undertaken in South Africa (Funke *et al.* 2009; Meyer *et al.* 2008).[2] The analyses also provide a summary of the support necessary to ensure a viable industry. A review of the biofuels industry was included in early editions but this has slowly turned into paragraph-long generic extracts given the industry's dismal performance (actually non-existent apart from a used-vegetable-oil sector) during the biofuel strategy's pilot phase (e.g. BFAP 2010). Apart from some remarks of the policy as being uncertain,[3] the BFAP reviews have largely focussed more on commodities rather than the policymaking process, save for Funke's Doctoral thesis and subsequent peer-reviewed article published the journal *Biofuels* (Funke & Klein 2011). In 2008, they also produced a report dealing specifically with the potential impacts of proposals made in the biofuels strategy, and modelling some alternatives (BFAP 2008).

As discussed in Chapter 2 there are inherent strengths and weaknesses when using rationalistic approaches to model and explain policymaking, especially strictly economic game-theoretic models. Inasmuch as theories of instrumental rationality have progressed

> this advance comes at the cost of conceptualizing intentionality in terms of a relatively thin theory of human rationality… Anyone who has waited at a traffic light when no-one else was around, however, has to admit that there are dimensions to the relationship between institutions and actions that may not be highly instrumental or well-modelled by rational choice theories (Hall & Taylor 1996, p.951).

[2] It was the BFAPs work that was used as part of the Feasibility Study discussed in Chapter 6. Their less–than-optimistic view of the potential for biofuels lost them some support from industry players and policymakers during the process (Meyer, *Pers. Comm*. 2010).

[3] BFAP (2010, p.6) suggests for example: "In the case of biofuels, the South African government published its industrial strategy in December 2007. This strategy has been incorporated into the model. However, a number of issues were not clearly addressed or explained in the industrial strategy and much uncertainty exists in the market regarding the production of biofuels".

Nevertheless, as Peter John (2012) highlights, these rationalistic models are one mechanism to identify causality and allow for comparison between what would have been 'rational' and what actually happened (see also Thelen 1999; Koelble 1995). This is why Thomas Funke's work is so important and will be summarised here; as he suggests "[t]he game provides an excellent insight into how government actions have been unfocused and irrelevant" (Funke 2010, p.15).

A Commentary of Funke's Thesis

Funke begins his thesis by considering the inherent need for biofuels (win-win narratives) and insisting that best practices in developing associated industries incorporate multi-stakeholder approaches. Best practices such as that of Brazil, the United States of America (USA) and to lesser extent the European Union (EU), have achieved the necessary support systems, whereas South Africa has failed. South Africa's policy goals are based on too many different interests, resulting in a policy of no support. From this backdrop, his problem statement is one of contrasting views that need to be accommodated through the policy process, which in South Africa includes economic feasibility of production, environmental sustainability, effects on food security, energy efficiency of the fuel and the benefits to rural economy and job creation. It is also acknowledged that:

> [the] historic development of the biofuels industry in various countries has shown that the success of the industry, especially in its developing phases, is largely dependent on how the policy development process was handled and who was involved in the process. It is unwise to assume that a successful policy can be developed and implemented if the development process is based on inaccurate and biased information (*ibid.*, 2010, p. 7).

This quote raises some interesting points of discussion. The first is interrogating further the idea of biased and inaccurate information. As I have argued in the previous chapter, the 'biased' and 'inaccurate information', if this refers to the Feasibility Study, is part of a process of legitimization and social construction and is not easily separated from the successful (or unsuccessful) policy it is used to develop. In this chapter, I aim to address also that the biases of the strategy do not result from this (mis)information, but from the decisions of policymakers falling outside of the more coherent network of similar thinking (or rather thinkers). The

issue then is identifying what information becomes important and how it may be categorised as *mis*information and biased.

A second set of issues refer back to the meta-analysis of policymaking described in Chapter 3 and the framework provided in Chapter 2. In the above quote, there is an implicit understanding of the importance of networks in policymaking—'who was involved'— but also an implicit sentiment towards instrumental policymaking—the industry would be better if policy was made better based on better information. Funke also implicitly acknowledges the importance of power and expertise in policymaking, in which he hints that Brazil had the right people at the table and took a pro-active approach based on sound evidence whereas, in South Africa the process, arguably, was based on flawed information and poor policy processes – supposedly with the wrong people at the table.[4] This further emphasises a reliance on instrumental policymaking, but neglects that the right people at the table is a subjective or loaded supposition. One could clearly ask who the 'right' people are? A question to which I will return?

On the appropriateness of the Brazilian example as a suitable policy framework to spur on an industry, compared to the dire state of the South African industry, Funke is far more explicit. What such a process actually comprises is unclear but that is not the point of his argument. It is an important issue, however, as we have seen the BTT has aspired towards the Brazilian ideal and South Africa, as a BRICS member, continues to use other member states as examples. (As a former BTT member suggested, looking at what the other BRICS are doing is a prerequisite when developing policy). The comparison is a difficult one when considering Brazil as a best-case example directly applicable to South Africa. Though both countries have

[4] This raises the fundamental question of who is better to have involved. Are the 'right' people 'right' because they are experts or because they are powerful (not that powerful people cannot be experts)? Such a question, when viewed through a 'Brazilian prism' would have to identify which actors were the right ones seemingly by whom they represented. As an industrial strategy for South Africa, the Brazilian case serves a useful example only in that it has a thriving industry. Whether that is a sufficient measure of success is debatable. The weaknesses here are that appealing to successful industry as a signal for good policy substitutes outcome for process—a process occurring over thirty years and unlikely to be the rational technocratic process advocates of 'Brazil-style-biofuels-development' assume—but also substituting one outcome for holistic success. Brazil may have a 'thriving' ethanol industry, but its true costs, environmental, social and environmental are disputed (see Wilkinson & Herrera 2010) and, being quite different to South Africa, should already present some precaution being taken.

recently liberalised and face massive inequality and development challenges, Brazil's economy is four times the size of South Africa's, as is their population, whilst the unemployment rates are about half that experienced in South Africa (World Development Report, 2005). In terms of Biofuels, the support provided to the industry in Brazil occurred under a military-government that was able to enforce a highly regulated market and force market uptake (Wilkinson & Herrera 2010). A global playing field, as well as local objections, especially from powerful private-sector interests, has made this far more difficult in South Africa. Such regulations have also presented challenges to Brazil, with the country having to import ethanol when sugar prices out-compete those of ethanol (*ibid*.). Second, Brazil is a/the major exporter in agricultural/sugar-related products (with a climate to match), well beyond the abilities of South Africa. There are also misconceived notions of a successful Brazilian agriculture and additional difficulties in both countries to indigenise an external agricultural model. Finally, there are political differences between the two, especially with regard to the prospects for rural development. There are limited counter political movements in South Africa to hold government in check (whilst Brazil has the world's largest Landless Rural Workers Movement) and the Tripartite alliance and internal feuding in the ANC undermines democratic institutions in ways not seen in Brazil (Africa Research Institute 2007).

The point is that while similar approaches might be taken to policymaking, the content and policy choices will be necessarily confined and simply transposing processes is as unwise as basing policies on misinformation and bias (though one should perhaps interrogate on what basis the Brazilian policy was developed). This too is somewhat beyond the scope of Funke's argument—especially considering the strategy is one of 'industrial' biofuels and he constructs a picture of what 'industry' requires—but raises the importance of substantive nuance, especially of political deliberation, which I take further in my research.

The value of game theory as a causal analysis and the notion of instrumentally improving policy are captured within the hypothesis and aims of Funke's thesis. His main aim is

> to build on the knowledge and experiences gained from the first policy development process and to further explore the factors that played an important role in the first process, as well as the actions and reactions of various role players (*ibid.*, 2010, p. 9).

The hypothesis is one that instrumental policymaking following the example of Brazil will lead to the creation of a successful and sustainable industry. What remains for his study is

> to illustrate tools with which an accurate process of policy development can be followed; indicating the important role players at each level of the policy development process and their roles within the industry, and what policies need to be in place in order for such an industry to function optimally (*ibid.*, 2010, p. 11).

The approach is one using game theoretic simulations to "determine the Nash Equilibrium at which the various role players should find themselves, given rational decision making and strategies". These rational decision-making strategies are based on an understanding gleaned from best practices (notably Brazil, the USA and the EU)[5] that have all, to varying extents, supported industry developments through a suite of tools available to fledgling industries (mandates, tariff protection, etc.). There is a clear preference given towards establishing the industry in the case studies, although in a section entitled 'rethinking biofuels policies' some of the risks and issues involved in establishing biofuels policies and producing biofuels are discussed. However, the logic of ensuring such a wide array of objectives whilst accommodating such risks is not included in the game.

In Funke's model of the policy deliberation, the premise is that the DME propose and develop a strategy to establish an industry "in addition to achieving a number of other political goals [including rural development and renewable energy targets] in

[5] He provides a succinct summary of these as follows:

> The policy development process for a new and infant industry is one of commitment, learning, further development and refinement. Brazil has shown that the correct approach leads to a sustainable industry. The US has shown that the implementation of a policy can be profitable at first but if the market is not quick enough to adapt, problems can occur. The EU has shown that a cautious approach is reasonable but not sustainable and that solid goals and objectives need to be in place (Funke 2010, p.42).

The argument is somewhat tautological as the 'sustainable' industry is always going to be perceived as the correct one and will positively reflect on the policy but these links may not be so clear (e.g. Mosse 2005). Such assumptions completely remove the context in which and processes through which such success was made possible in the first place.

the process". The main players are the former DME—the first mover[6]—with the two others being the Department of Land Affairs (DLA) and the Department of Agriculture, Fisheries and Forestry (DAFF). As the goal of the BISSA was to steer biofuel production towards self-sustained development, a first assumption is that the DME would want to see some form of production taking place and incentivise. The second player in the game is DAFF who took a backward stance on the strategy because of the 2008 food-versus-fuel crisis, although as I will argue later this is a very simplified description of what had happened. I argue that food-versus-fuel may have been one reason but is not the only reason, and was not necessarily a decision taken by the DAFF in any case. The third player is the Department of Land Affairs (DLA), whose role in the game is largely defined by the DAFF taking a focus on rural development. DAFF's rural development focus pushes up the prices and makes rural communities wealthier, thus making Land Affairs successful too. The assumptions here take a somewhat biased reading of the food-price-dilemma and rural development in general[7] but the idea is that if the incentives are not provided, the DLA will not be guaranteed success and being risk averse will not play an active role.[8]

[6] "Since the development of biofuel policies in South Africa have fallen under the control of the Department of Energy's control since 2003, it became clear that the DoE would be a first mover in the game". The nuances of this can be seen in Chapter 5 in which I discuss the path dependency or agenda setting phases of the BISSA.

[7] In a very simplified picture of the food price dilemma (Van Zyl & Coetzee 1990; Cf. Ruysenaar 2011b), Funke (2010) suggests that higher prices are better, an assumption strongly backed by Schimdhuber (2006) who argues "that higher agricultural prices will have a positive impact on rural household incomes" (cited by Funke 2010, p.54). Yet this denies the essence of the food-price dilemma in which the price rise does not automatically lead to benefits for the farmer (although this may be likely) and does not benefit the consumer or the labourer; whom may be made more vulnerable and be in the majority. Whereas I agree fully that investment in agriculture is far below what is necessary to create a thriving rural economy, I disagree that the biofuels are a *deus ex machina* to make that happen, or at least create immediate benefits for all. Government, as it happens, came to a similar conclusion although their reasons were very different to mine, as I will discuss later on.

[8] With these three players included, there is one major limitation to the game when compared to the shifting dynamics of the policy subsystem (even the inner core of the imaginary) I have discussed in previous chapters. That is, the number of players extends well beyond these three, although it is granted that they are significant and have the most to gain. The limitation is that the vested interests of the other players become subsidiary to these when, as I have shown and will argue further, were not the main features of the policymaking process. Again, this should not be seen as singling out Funke (2010) as erroneous. His point is that these 'should' have been the arguments made and why they 'make sense'; mine is an interpretation of what actually happened, whether sensible or not (which ultimately depends on one's viewpoint).

The purpose of the game, based on the above assumptions is to show that "the rural development and self-sustainability goals can be better attained, by both DAFF and the DLA, resulting in higher payoffs for them, if the DoE engages in a strong incentive driven [BISSA]". To explain the situation in which this is not the case (as the first game and decisions by the Task Team came to), a cost or risk variable is added into the game, the so-called 'z' variable. As Funke notes:

> the risk variable is perhaps the most important factor affecting the way that the government departments, especially the DoE, have responded to the calls of the industry. The z variable represents a critical uncertainty parameter made up of a number of aggregated factors including an unclear, confused information flow from various role players, uncertainty, the resultant high costs of attaining a licence as well as the uncertainty that the role players face in promoting a policy; which in turn could impact on the consequences that they will face from both the public and other government departments. In other words, it represents a situation in which the government would risk the consequences of making large and important uninformed decisions.

Funke's work provides an important contribution to explain what happened, or rather did not happen, in the policy process, however, it is only a partial explanation and leaves open empirical detail of the 'z' variable. In many respects, this 'z' variable points towards the politics of the situation, especially when it is considered that politicians do not solely act as pure '*homo-economicus*'. This brings us to the econometric review of Adams *et al.* (2009) and the politicisation of what they consider an economic decision.

Market Logics Versus Politics – This Time Politics Won?

Adding to the misinformation diagnosis presented in Funke's game-theoretic analysis of the industrial biofuels strategy in South Africa, Adams *et al*. (Adams *et al*. 2009) suggest that politics trumped economics and consider this a mistake. To a degree, it is a mistake, but only if you are uncritical of the market and its ability to develop rural areas on its own. As I will show, politicians were critical of this, not because they have limited faith in the market *per se*, but because they are cautious as to how the market actually works, who pays for it and in whose favour. The criticism of Adams *et al*. (2009) also reduces the use of knowledge to an instrumental positivistic

basis,[9] which for them means policy change is the result of knowledge being subordinate to political interest. As Adams *et al.* (2009) also provide important insights as to what was happening during the later phases of the strategy's development, which bolster some of the findings from my own interviews. I will provide a synopsis of these briefly before moving on to my own findings and discussion of 'what happened' and on whose terms.

Adams *et al*. (2009, p.4) consider three fundamental challenges in the biofuels policy process. These included the changing focus from environmental concerns to addressing job creation for the rural poor, the "limited capacity of government", and the need to "create a tool vague enough to be applicable to each of the unique and distinct regions within South Africa".[10] They then indulge a range of issues that have been encountered in the previous chapter. The most important of these are the influence of BEE and ASGISA, the food-versus-fuel debate in which they support the use of maize, structural concerns relating to linking the so-called first and second economies, and end off with a cost benefit analysis. Compared to Funke's PhD, the work of Adams *et al*. (2009) more closely resembles my own exploration into the development of the biofuels strategy. They encounter and outline similar debates that have been involved but as I shall argue my interpretation of these events and what they signify differs to theirs. Adams *et al*. (2009, pp.33–34) also present some policy recommendations, including:

- a wider target needs to be established that incorporates both rural subsistence farmers and commercial farmers;
- a suite of realistic vehicles to assist the emerging farmers needs to be developed;
- there needs to be a support for extension services (perhaps by commercial farmers);
- a measured inclusion of maize as a feedstock needs to be reconsidered.

[9] As described in Chapter 2, a positivist view of knowledge removes the need for excessive consultation over technical decisions because any group of experts would eventually derive similar recommendations and solutions for policy (see Fischer, 1993).

[10] The latter I have argued is, whether wrong or right, a hang-up from institutional arrangements (see Chapter 6) and is a common issue encountered by policy makers. I have interrogated this relationship in my MSc. thesis (Ruysenaar 2009; see also Ruysenaar 2010) and subsequent journal article with Scott Drimie (Drimie & Ruysenaar 2010).

It should be noted that, in addition to these two major reviews, there were a smattering of MBA's and Masters dissertations within South Africa, undertaking rather rudimentary studies of the fledgling industry and somewhat limited appraisals of the strategy. Seemingly representative of the hype around biofuels at the time—2006/7—much of the research was looking at the viability of biofuels and, furthermore, what support the government would need to provide to ensure success. The MBAs were especially focussed on supply side issues and funding proposals (see the MBAs of Chambers, 2006; Chetty, 2007; and the masters theses of Nolte, 2007; Roach, 2006; Smith, 2008; Strydom, 2009). They reach very similar conclusions and recommendations as those mentioned above and in the wider literature covered in previous chapters. Brent *et al* (2009) also look at the viability of the biofuels strategy in terms of the three conditions of sustainability: environmental, social and economic factors. In the next section, I shall rejoin the empirical narrative of Chapter 5 and explore such issues as they enter the realm of policymaking, rather than specifying the expectations that they should.

FILTERING FEASIBILITY AND CONSTRUCTING A POLICY

The previous chapter already suggested a more complex relationship between evidence and policymaking than the above authors propose. It was also argued that the evidence gathering process, although bounded within specific rationalities and credible for the networks of support associated with it, was not important for what it said but the legitimisation of certain perspectives in the unfolding policy process. If we are to take the feasibility at face value, there was actually little motivation to continue with biofuels 'rationally' speaking, but when couched in terms of potential job creation and other advantages, there was an assumed national benefit. In this section, I take the idea of legitimisation further, not so much to provide further evidence of it but rather to look at how the policy is actually drafted. There is, unfortunately more conflicting opinions of how this occurred than one would expect.

The Drafting Process: Negotiating Beyond what was Feasible

The following quote by a consultant involved in the Feasibility Study sidelines any potential rational or objective approach to the drafting of the strategy, at least in terms of directly using the feasibility report.

> *Yes, but [the Feasibility Study] was considered as politically incorrect so all aspects regarding, well, when you look at the draft that was published, they all agreed that feedstock grown in former homelands would be the way to go but there is no infrastructure etc. they basically wanted it to be politically correct* (Consultant B, 2010).

There has been some disparity in the responses from interviewees as to who actually drafted the strategy and under what terms. Some respondents from the NGO sector suggested early on that the South African Biofuels Association (SABA) had played a major role in the drafting process but discussions with SABA leadership indicated that this was not the case. Although involved early on in the feasibility studies, their criticism of the *draft* Strategy further substantiates their non-involvement (or that they were ignored) as, while clearly advocates of biofuels they felt the *draft* Strategy was inadequate (South African Biofuels Association 2007; see below). I raise this issue merely for clarification since there is a perception among civil society that SABA played a more direct role. This influence, at least in an overt or covert sense, was indirect at most and largely ignored in all likelihood. Their influence on 'framing' through lobbying should, of course, not be ignored but is equally difficult to decipher given their unclear interactions with the BTT consultants.

In a discussion with the consultants involved in the Feasibility Study, it was suggested that the Feasibility Study was summarised into the policy document that was then sent to cabinet.

> *… I think we did actually draft it. Oh, from the Feasibility we drafted an industrial strategy that we hand[ed] over, like a ten-pager or something. So that was the draft Strategy and that was the consultants view" […which was then submitted to the Task Team]…* (Consultant B, 2010).

A former chairperson of the BTT suggested something similar.

[Interviewer] So you were around for the *Draft* Strategy, who crafts or writes that up?

[Respondent] *I would say Raoul has the most role in that* (Former BTT chairperson D, 2012).

Such a situation suggests that the consultants and the IDC/CEF have the greatest influence over the drafting process. It also carries a logical consistency, as the experts would have had a greater understanding of the emerging issues of most importance to the strategy. The power here, again, reflects not that of absolute control but establishing the frame of reference and path dependency to further revisions.[11]

Whereas control by the CEF/IDC seems likely, it is contrasted with officials involved in the process who state that individual directorates would have drafted their specific sections with final agreements negotiated by the BTT. Given that most of those involved in the process (that occurred over five years ago) have now left, it has been difficult to gain a clear picture of the actual drafting process; although it is ultimately a case of both of the above. What is important is that there was still a vague consensus between the Task Team. As one BTT member stated:

> *when we did this [Draft Strategy] we had consensus, the Department of Agriculture had spoken about some land that would have been available for growing of the feedstock and later they had a problem with it. I also recall them including maize in this document, so we had the land and the maize. We agreed. DWAF was upset about the water. And then it went to cabinet there was incidents at a higher level, that I was not involved in. They may have had some involvement but it was probably the DGs or the Ministers* (BTT member C, 2010).

The latter part of the statement refers to the *final* Strategy that I will return to in due course. The importance is the consensus of the original *Draft* Strategy despite some conflicting opinions in the Task Team. This respondent from the BTT also suggests:

[11] One has to locate this in a Task Team environment. The point being that by as the first instigator, the consultants and IDC/CEF coalition establish frames of reference and associated anchor point of the discussion, even if there was room to negotiate what was put into the strategy (and indeed what was looked at in the Feasibility Study itself) thereafter. Negotiations never divert very far from the initial anchor point (see Kristensen & Gärling 1997 for a monetary example).

> *when the consultant did the consultations with the relevant departments and collected the information into the document… when the Task Team sat down they looked at what had been collected. It's so funny now that I think about it because when this document was actually instigated it was so that the country could improve the economy and energy security. But come approval time, they put in all that stuff about social impacts and jobs and all that is actually why feedstock like maize was there because the initial development of the strategy was not so we can look at food security and jobs, even though it's important, unfortunately it was not the primary driver at the time* (BTT member C, 2010).

Another respondent from the BTT suggested:

> *The strategy is very 'wishy-washy'; they want to make everybody happy!* (BTT member A, 2010).

The vague sentiments of the strategy illustrate a weakness in its ability to accommodate all the views and interests coherently. As one member from the IDC mentioned *I think there were too many people that put their two cents in and they came up with the rubbish piece of paper they came out with* (Consultant D, 2010). 'Rubbish', here refers to the limited details it provides and the lack of discrete objectives with which the industry could move forward. As a negotiated settlement, there were obvious concessions that had to be made by the DME, although some interview responses suggest that these were less than the rational prescriptions game-theoretic models suggest.

> *So this committee [the Task Team] this 12 + 1 committee, and there was this guy from Agriculture who was a DDG, he was a destructive character, he was just saying you can't grow jatropha. And we would say what's the scientific basis for that, and he would say no there is no scientific basis* (Former BTT member D, 2010).

There is also the issue that, although it might be in the best interests for DME to establish a thriving biofuels industry, they are reliant on agriculture. Even if they are the first movers in the game (which they were not), they are reliant on at least two other key aspects – agriculture and water. As one advisor to the Department of Energy informed me:

> *from a policy perspective there are two crucial areas and neither of them can be addressed by the DME, that is the food security*

> *issue, which I am not too worried about, but the more important issue for me and I have been making this point to the DWAF and the DEAT and now the DME—I sit on the integrated energy planning steering committee of the DME and also in terms of my advice to the minister at the EDD it has been consistent with all of them—is that my personal belief about biofuels, the strategic elephant in the room is that I don't believe biofuels are a viable option in a South African environment because we are a water stressed country and essentially biofuels is putting rainwater in the tank of the car* (Consultant E, 2010).

In the early drafting processes, there were some contrasting opinions, but the BTT managed to worked towards consensus by filtering away the most controversial of issues. There are two camps of respondents here, one suggesting that the CEF/IDC played a paramount role, and the other that the BTT was sufficiently able to steer the consultants and the IDC/CEF. In the Task Team negotiations, water, land, crops and financial viability appear to have been paramount and the solution to disparities seems more about excluding them as issues than prescribing specific ways forward. As one informant suggests, changes and comments made to drafts would be completely ignored. A former BTT chairperson suggested, "one should not confuse conspiracy for cock-up". As a particularly graphic version of Hanlon's Razor, the argument was that the negotiations were not all cloak and daggers but that issues were scrapped because record keeping was slack, there was dramatic flux between the people representing departments in the Task Team and of the meetings themselves.

The point is that the strategy is increasingly vague because this is how strategies have come to work in South Africa, as Adams *et al.* (2009) have already alluded to for biofuels. It is not only that it is an abstract policy that has to cater for the complexities of the South African landscape but also about glossing over uncomfortable and antagonistic questions and preserving certain approaches; at worst considering them solved by the application of some technological intervention. This readily conforms to the existing understanding of the work of narratives and in a sense is a necessary element of legitimising multiple interests and stabilising a course of action. Even when considering objectives for a biofuels industry, the *Draft* Strategy (BTT, 2006, p6-7) states:

> [g]overnments typically have many policy objectives that are pursued concurrently and consequently any new intervention runs the risk of being diffused and lost among the myriad competing policies. This is especially the case with renewable energy interventions that may meet many varied objectives."

Either the Task Team were being reflexive, or those consultants drafting the strategy were subtly venting some of their frustration in developing a *draft* Strategy (although, this was just the start of their challenges). The problem is that in doing so, it seems here that the strategy itself has fallen victim to conflated agendas by maintaining its 'developmental' stance when the objectives deemed achievable within the Feasibility Study contradict such a notion. At the same time, it panders to political priorities in many respects and retains the rationale of the feasibility and its underlying agro-industrial stance. Nevertheless, it should be recognised that the *draft* Strategy was relatively unproblematic in its content; at least from the perspective of the BTT.

Despite negotiations over issues such as water use, including maize and some other points of discussion, there was actually limited argument at this stage as the *draft* Strategy still includes maize and *jatropha* and everyone seemingly had agreed. Although the strategy was vague (compared to the Feasibility Study), it still reflects a relative coherence on the part of the BTT, with the *modus operandi* being consistent with the agro-industrial imaginary, although sold through jobs narratives and linking economies. The above then hints at the importance of discourses and narratives within the strategy's development and it is to these that I now return; throughout the process, they proved a long-running motif that has held the strategy (but not necessarily all the constituent actors) together. In the previous chapter, for example, it was already mentioned that ideas of the second economy are mooted in the strategy, even though the Feasibility Study proposed that a different strategy would be necessary to allow for any beneficial involvement of small-scale farmers in the second economy. This point seems to have been entirely neglected in the *draft* Strategy document. It was also only one element of a much wider debate, which would take place once the strategy was pushed outside of the BTT comfort zone.[12]

[12] Further indicative of the strategy's neglect of the feasibility, is that those aspects of the feasibility needing further consideration, (food security and environmental concerns, the second economy, expert consultation etc.), are not given credence in the *draft* Strategy itself. In addition to

Although Funke's game simplifies the policymaking environment to only three constituent interests, he identifies the important role that external interests play. In doing so, he focuses more on specific lobbying and misinformation provided by vested interests, though there were many. He is correct in that what has been most important up to now was that the most powerful interests had largely been contained within the vague aspirations of the BTT and its alliances. An imaginary had taken shape and despite concerns raised internally, a strategy had been developed around it. It is through the public consultations that this imaginary, and the narratives and discourses underpinning it begin to unravel. An associated critique is that although acknowledging irrational decisions, Funke does not examine what this irrationality tells us about policymaking in South Africa. If we engage broader discussions about how these decisions may interact with overarching discourses and situations within the country, we might see that although decisions may not be *rational* they may *make sense*.

Public Consultation in which Cracks Appear

Stakeholders commenting on the Feasibility Study and the resultant *draft* Strategy varied in opinion; most were in objection, or hesitantly supportive. The Association for the Study of Peak Oil & Gas - South Africa (ASPO-SA), for example, are broadly supportive of a biofuels industry but raise a number of concerns that are included in the feasibility but neglected in the strategy (Wakeford 2007). These include food security, climate change, job creation, feasibility versus sustainability and transformation of the agricultural sector. They also contest the likely success of attaining development goals rather than just those related to biofuels *per se*.

The Congress of South African Trade Unions (COSATU) in contrast, is more scathing of the strategy. They state, for example, "COSATU will oppose strategies,

---

criticisms levelled at the feasibility, the *draft* Strategy failed to include many of the substantive cautions raised in the feasibility as the themes emanating from the Consultation suggest. Sustainability criteria and normative recommendations (as described above) rely on policy being technically derived. From the development of the South African policy, this seems an unlikely proposition.

even if cloaked in language that may appear to be developmental and progressive, if they cannot live up to their claims and promises" and that they cannot support this strategy until the process is reviewed and relevant stakeholders, including labour, are included (COSATU 2007).

Even those groups supporting the feasibility studies, namely the South African Biofuels Association, highlighted limitations, providing recommendations and proposing alternative approaches, for example, for pricing mechanisms to be used (South African Biofuels Association 2007). These respondents appear, however, to share agricultural worldview supporting large-scale industrial agriculture as the basis for biofuels, with close links to GrainSA and farmer lobbies. GrainSA was in fact one of the founding members of the SABA and a glance at their website illustrates numerous large-scale players of similar mindset (SABA 2010).

While suggesting that policies are written for an intended audience (in this case Cabinet), a member of the Task Team highlighted consultation as central to the process.

> *There is always different perspective when things are introduced and basically, you have to take into consideration what these different opinions mean. You cannot always accommodate the specifics but when issues are raised they have to inform what you do, and that is how we formulated the strategy after consultation* (BTT member C, 2010).

Although important to ensuring a robust strategy, the majority of these objections have not surfaced as important given the limited changes to the *final* Strategy. That negotiation happens after the *draft* Strategy is developed, makes the content of such a strategy the anchoring point for further discussion. This is very different to establishing the direction to be taken through bottom-up processes and makes any discussion reactive rather than proactive. This potentially suggests that consultation characterises little more than a 'lip service' being paid to the public (see further below). (The fact that there is only one round of consultations before finalising the strategy also limits the potential for meaningful dialogue; an issue also encountered in the latest round of consultations for mandatory blending and fuel specifications).

One issue sits apart from the above discussion. It was apparently the food-versus-fuel debate that became the central pivot around which the debate for and against biofuels revolved during consultation and beyond. I say apparently, as, although maize was removed from the strategy, it was not a simple omission made in response to the consultation and it should be remembered that the Task Team was not focussed on any crop in particular. If the second economy and job creation were narratives with which the BTT could garner support for biofuels, food-versus-fuel was a partial source of disintegration and rejection.

Enter Food-Versus-Fuel

The challenge of food-versus-fuel is briefly considered in the Feasibility Study but it haphazardly sweeps aside the concern of food price rises, replacing them with a general accounting matrix showing a more positive picture. If anything, the suggestion is that increased prices improves the market for farmers, which is a good thing. It is a good thing for farmers but in terms of the food equation, and food price dilemma[13] it hurts consumers, especially the poor. For this reason, there are two polarised arguments comprising the food-versus-fuel debate in South Africa. In the first case, the Feasibility Study is a preamble to a discernible agro-economist perspective, which called for the inclusion of maize based on the interpretation of modelling (e.g. Funke *et al.* 2009; Makanete *et al.* 2007) and neo-classical determination of the value of biofuels to the agro-economy, including the decisive role maize plays. Ultimately, mandating biofuels provides a market for surplus maize in the country, stabilises prices (though the increase encountered is debatable) and potentially allows new entrants into the markets. In contrast, during consultation, the policy drew criticism from a range of actors, especially civil society groups weary of the impact on food prices (e.g. Sugrue & Douthwaite 2007). The general theme running through their counter argument, considering maize is the staple crop in South Africa, is that using maize to produce ethanol depletes crops available for food and

[13] Food prices fulfil a dual role (or a food equation) in developing countries and regions: They act as incentives to agriculture producers and are major determinants of the real income of consumers. Higher prices may be necessary, at least in the short term, to induce increased production, yet this poses a high cost on low-income consumers. Timmer (1983) termed this the 'food price dilemma' and argues that dealing with it constitutes the crux of food policy (see also Appendix C and above).

therefore increases food prices as had happened internationally. Modelling by the BFAP suggested their concerns may materialise[14] and regardless, the unfolding international food price crisis legitimised their arguments in ways better than any modelling could have done so. This is not to suggest any personal value-judgement on either argument but illustrate that in popular food-versus-fuel discourse there were two characteristic polar opposites.

A third category that needs to be included here is the published academic material. Much of this has focussed on situational analyses, production potentials, and overall feasibility, with modelling undertaken to determine the macro-economic effects, support measures, production potentials, impacts on the feed market *et cetera* (Funke *et al.* 2009; Meyer *et al.* 2008; Von Maltitz and Brent 2008; Haywood *et al.* 2009; Von Maltitz *et al.* 2009; Strydom 2009; Strydom *et al.* 2010; Ngepah 2010). Food security is largely considered through ancillary food price effects within the various modelling activities or labelled an issue requiring caution. Also notable is a succinct paper by Adeyemo and Wise (2009), however, they only consider sugarcane as a feedstock for bio-ethanol and sunflower for biodiesel. They conclude that appropriate management will minimise significant impacts on food security. They do not consider maize 'empirically' as part of their review due to its exclusion from the strategy; an exclusion they support based on food security concerns. In general, it is understood that the increasing price of fuel, mixed with climate change and global increases in biofuels production are likely to put a continuous pressure on food prices. I have critiqued the nature of this debate in South Africa elsewhere (see

[14] In an optimistic ten *per cent* ethanol blend (in the national fuel supply) and five *per cent* biodiesel blend scenario, under 'normal' weather conditions, with government administering the requisite (but unlikely) tariffs to ensure feasibility, the prices of white and yellow maize increased by 12 *per cent* and 18 *per cen*t over the long run (2012 – 2015) respectively (BFAP 2007, p.23). Should shortages occur, during a drought for example (not unlikely in South Africa's climate!), the local maize industry can be expected to move quickly to import parity scenarios (higher prices for maize). Similarly, increased demand for yellow maize (used as animal feedstock and favoured for bioethanol) will displace other field crops with a likely increase in the price of white maize (used for human consumption in the form of maize meal). In the second, less likely scenario (with no protective tariffs provided by government), the white and yellow maize prices are projected to increase over the long run by seven and eleven *per cent* respectively (*ibid.* 2007, 30; see also Strydom, 2009). It is interesting that the BFAP models have been used to both challenge and support biofuels production in South Africa.

Ruysenaar 2011; Appendix C) in terms of ill-considered focus on either food prices or rural development when the two are linked and need to be reviewed as such.

Even the reviews of Funke (2010) and Adams *et al.* (2009) fall within the relative confines of a polarised and partial assessment of the agro-food system in South Africa. A lack of certainty, even within the academic literature, of course makes it difficult to discern which side of the debate is actually right or wrong. Such a value judgment both resides and is validated within distorted discourses, which in many ways abstract from or hypostatise the political economy in rural areas.

It should be noted that there is a powerful apparatus surrounding maize, its production and place in the agro economy (Bernstein, 2004; 1996) which underpins the importance of maize for biofuels (and *vice versa*). From the Agro-economic perspective, for example, one of the early advocates stated:

> *There is a reason, perhaps not explicitly mentioned in previous papers for using maize. The fact is that if you can't crack it for maize you not going to understand it for sweet sorghum. And this is where some of the people who make the argument, why don't you use sweet sorghum. You can't start your debate at sweet sorghum. Who plants it in SA? You literally have to start a new value chain for sweet sorghum so for someone, I met someone saying they were going to establish new investment climates, provide the research, all those other vestiges required the sweet sorghum value chain ... I find it hard to grasp. Where is the technology? Tell me one big international—Monsanto, Pannar et cetera—investing in sweet sorghum. South Africa has stopped investing in [the Agricultural Research Council], and the [Council for Scientific and Industrial Research] has invested a little bit into sweet sorghum but what is the core required to produce sweet sorghum, and if you do are you going to be an island in this world where nobody produces sweet sorghum. And the arguments raised by the NGOs in my view don't [go] the whole way; they are shallow* (Consulant C, 2010).

The above quote hints at the unquestioned power of maize and in some ways updates Bernstein's (2004) discussion of the 'Boys from Bothaville' or big maize in South Africa, or presents new complications in the spatial and political organisation of the *maize filliere*; though this is a separate debate and taken up somewhat below. The importance of such a quote is also the distortions that occur in the maize discourse.

In a discussion with a BFAP representative, he suggested that the stories and proposals being put forward when arguing for the inclusion of maize from the agro-economic perspective were contrived from complex (and less supportive) debates.

> *The standard argument is South Africa produces this surplus, take the surplus away and we are not going to make an impact on food, and I said come on let's be honest, how does futures and price recovery work ... if you take away that surplus it implies that we are only just barely servicing our own market and we then run into import parity and that's exactly what happened in the last six months, and so we have the perfect example right there* (Agricultural Economist, BFAP, 2012).

This was not different to what I had found in Cradock, in which a review on food price/security concerns was outsourced to look at impacts on food. The confidential report emanating from it suggested a far more simplified and unproblematic situation (cherry-picking findings) than the actual review (and the reviewer) had suggested (in interviews). (This is also not only a feature of the food security debate. It resonates with the use of the Feasibility Study in the strategy's development and has also been encountered in NGO reports of the biofuels sector, according to researchers I have met with, as well as consultant reports.) On the use of maize, there are, however, nuances that also come through from government's side, though these were not made explicit in the strategy itself. Arguments from the DoA members of the Task Team were also not against the use of maize per se:

> *To me there is not a problem with using maize, it's the easiest you can grow and there are eight million hectares that we can grow maize on so if you only get two tonnes per hectare you get 16million tonnes, excluding what we are already producing. The problem with maize is that you talk to the value of the fuel and the rest [by-products such as animal feed], then the rest has more value so you need to look at the total value chain and then you determine what it's really worth to you* (BTT member D, 2010).

It is important to note then that the technical levels of government, especially the DoA, were not entirely against the use of maize and supported it on some grounds. They were thinking further than just a pre-occupation with producing biofuels, although it seems the agro-industrial imaginary were not particularly interested in too many details. Of course, this is a crude generalisation of the overall literature but an

in-depth analysis is out of place here. What I wish to show is that, first, there is an unhelpful and extreme polarisation, and second, there is a lingering question as to whether these various actors are not just arguing on the periphery of policy-making discussions; that is, they may be involved in heavy debate, but those that decide were hardly listening. In terms of the former, the fact remains that much of the discussion was fixated on maize and mostly of its use in the existing first economy. The proponents take for granted the 'first world' situation even though it is fraught with difficulties and contra-positives. I have also not interrogated, in as much detail, the contrarian argument of potential price increases put forward by civil society groups and academics (see Sugrue & Douthwaite 2007) in response to the use of maize. Realistically, similar criticisms apply to both, although I discuss the full debate elsewhere (Ruysenaar, 2011). In terms of the latter, despite the overriding debate, it is the second economy that preoccupies the political hierarchy and decision-makers had their own ideas about how food-versus-fuel would play out.

As a basis for my second argument, it is necessary to show that it was not the debate that had much impact on the policy process but rather executive decisions. The ministers in the Cabinet decided not to include maize. The *final* Strategy sent to cabinet, according to three separate respondents, still included maize. After Cabinet, it did not. As one Cabinet minister stated:

> *The concern … was that it was driven by the maize industry who were concerned about their surpluses and this was something that would absorb their surpluses and then came the exclusion—or some people have spoken about the banning of maize; there has never been a banning of maize and people do speak about it in an unchallenged way, I don't know where there is such a law. Maize is excluded as a key crop. The maize farmers obviously got up in arms about that because they were planning to set up plants in Bothaville and now we are saying in terms of our strategy we are not supporting that and there were a lot of good reasons. They were pushing it for their own reasons and you don't get pushed by vested interests when you are looking at a commodity. You get pushed by what the purpose of the strategy is, which I will get back onto, such as more renewables and through doing so there are job and rural development benefits and lesser dependence on fossils. You know the maize farmers are using nitrogen to fertilize and using mega fuel to cultivate the land* (Former Minister, 2011).

Bothaville—a farming town and commercial farming 'Mecca' in South Africa—again reflects the important juxtaposition of white commercial farmers and the ideals of the ANC government. Although playing out within the food-versus-debate there is a strong polarization on the part of policymakers who were unimpressed by the BTT and the predominating agro-industrial imaginary. Another member of the Task Team stressed:

> *The biofuels strategy was accepted in December 2007, most of the decisions taken before the biofuel… well we said we would use any extra production over and above food supply, so maize was not excluded. Then in November, the times showed a huge article on the impact of maize the US, the maize prices increasing 34% per cent due to ethanol use in America. Other documents state between four and eight per cent. So [Tito] Mboweni [who] was our reserve bank governor walked into Cabinet with this document and said, if you approve maize your [food] products will be 34 per cent higher! So, they excluded maize. Although the Task Team was not supporting that, but due to outside interference, that's what happened* (BTT member D, 2010).

The above quote thus proposes that maize was never really excluded based on any evidence or arguments in the consultation. It was politically motivated and was based on short-term *ad hoc* analysis of the situation; perhaps best classified as a mix between Khosa's (2003) Executive-Consultative and Panic models (see Chapter 3). The BTT member continued:

> *So then food prices escalated, but they didn't escalate because of food. The fuel price escalated and the food prices increased in response but nobody blamed the fuel. Everybody blamed production. But you cannot produce without fuel. So no, nobody wants to use food for fuel [because] the price is so high. The price of fuel dropped and maize was at that stage R4300/tonne now its R1100/tonne. When we started in 2000 the price was R500/ tonne. So if you average this out, then you find the maize price hasn't increased that much but due to these spikes it looks terrible at the time. And the only thing they could blame at the time was biofuels. And if you take those decisions into long-term planning, if you put up a plant, you have to plan for thirty to fifty*

> *years and you have to create a scenario*[15] (BTT member D, 2010).

Responses again differ, and without access to any kind of documentation, judgement can only be made using people's opinions. Yet another BTT member briefly suggested

> *The food security thing was a knee jerk reaction from DoA … It was the minister of Agriculture during the rapid rise of food prices. Not from the department but from the ministry* (BTT member A, 2010).

Another BTT member also suggested that:

> *And so every minister would want something in the strategy that would take particular view on things. And then later on, the maize prices went up and government, there was this international voice that emerged from the United States about when the US introduced this 50c subsidy for 1L ethanol, then there was this big demand for maize to produce ethanol. Government bought the argument about food security and all that. And then they ruled no maize for fuel. The whole food security argument was raised and it seemed to have persuaded the ministers….*
>
> *They would be debated and the food security argument was stopped, you know agriculture crushed the argument by saying we are the police of crops, and we decide who can grow what where, and we [are going to] decide. There's nothing for you to debate we are going to decide* (Former BTT chairperson B, 2010).

In the Task Team, there was equally support for the maize lobbies, as one early member that left midway suggested:

> *At that stage we were engaging with GrainSA and they were putting together a very ambitious plan and I think it would have been successful, on ethanol from maize, only because it would stabilize the market and my philosophy would have been that I would rather have them producing biofuels and being able to switch to food or even import food than have farmers go bankrupt. I would rather see them in business. Nobody gave a*

[15] An interesting discussion emerged from some initial viewpoints, in which the timing of decisions was crucial. In the earlier phases of the Feasibility Study and when the biofuels hype really took off in 2005, the economy was booming and so biofuels looked like something worth pursuing. In 2007, there was an emerging energy crisis, food prices were starting to rise and suddenly, biofuels appeared to be something much further down the list of priorities than it previously was.

> *hoot about that, it was just no you can't use maize. There was the interdepartmental team, and Rod was driving that for a while and myself and others but we had to respect the wishes of agriculture. Even treasury was supporting, Erwin Obermeyer is a knowledgeable guy and making key recommendations. The issue with Agriculture was that they said they will determine what the strategy can and can't do and they just turned around and said no maize. Then they would come back and say no jatropha, etc. etc. There is this paranoia about agriculture, and all we need to do is manage it properly. It should have started with pilots and then you study and look at what happens. We didn't want to roll everything out nationally – you need to do something and then see if it works and what works etc. So what happened actually was that government put the cart before the horse. In the push for an industrial strategy we never answered all the fundamental questions we needed to first* (Former BTT chairperson D, 2012).

I have interviewed four of the various 'chairpersons' of the Task Team, all of whom have basically supported the idea that maize was largely supported until political interventions, more than anything, lead to its exclusion.

> *In SA, the food versus fuel debate was championed by minister Manual. I am talking at the Cabinet level. But before the Cabinet, the scoping study didn't delve into it in much detail. It was mainly looking at what crops could be produced on a sustainable basis focussing largely on this thing being supposed to be creating six million jobs in the second economy. The commercial versus second economy did not come into that because the whole point was saying, we are driving this thing to promote development in areas in South Africa that could potentially be growing things and employing people but those areas are not [producing] because the view was that most of them don't have an off-take for the crop that they might grow. It's only when this thing goes to Cabinet that people start to consider the food-versus-fuel thing, largely based on what people had seen happening in the US … so the actual debate itself was actually not part of the Task Teams mandate or ToR* (Former BTT chairperson C, 2011).

Ultimately, it is clear that, even through consultation, the agro-economists' point of view was given preference and was the basis of the strategy but this conflicted with political aspirations.

> *They agreed with all the conclusions, they also saw that there was surplus maize and we could do it economically but then the ministers still said no we can't use maize. But we went there with*

> *an argument saying that we were going to use yellow maize, which is not used for human consumption. But the minister said no no no, no maize. If you can just leave [out] the word maize then you will get the strategy. So [we] went ahead, did the strategy … dropped [maize]. I can tell you, cabinet enthusiasm just faded. And the biofuel strategy, the document, and of course after we finalised the strategy there were a lot of consultations that there were a lot of people were interested, but when we finished these consultations and the strategy then we had very few licenses that were issued. I think there were two people* (Former BTT chairperson A, 2010).

A consultant in the process suggested:

> *Well look, they took out maize more because the ministers decided to take out maize, ok, because it wasn't politically, well it was a nice political statement they could make. That was a bit of a political, treasury, agriculture, thing and that scared off a lot of the investors because South Africa knows how to grow maize and all that* (Consultant B, 2010).

One aspect no one has questioned is that the maize-to-ethanol proposals are the pivot around which the food-versus-fuel debate has been hinged. This speaks again to power and hegemony, or at least structural features of the agro-economy and its effect on policymaking—that is meaning-making—processes. It is the idea of using maize that holds significant power over policymakers in South Africa, not because they are worried about food security *per se*, but because of the power structures that the predominance of maize represents. (What is ironic is that there may be some benefit to growing maize in the second economy under the right conditions for both food and fuel markets but the concerns dictated by the implications of production in the first economy have closed out such potential; the boundaries between the two are ideological and based on warped imaginations of the political-economy more than physical conditions or practical concerns.)

Whether maize was removed due to the consultation, political 'interference' or both, the importance here is what its removal means for the policy process (and indeed building on narratives and technical expertise). First, a major problem for the maize fraternity was that the majority of its farmers—white commercial farmers—reside within the 'first economy' and are unlikely to receive much political support. In this case, they are on the wrong side of a discursive (and material) divide, despite their

importance to the country. It also suggests that policy decisions may rely on ideology more than technical processes preceding them. That is, given that potential surpluses of maize underpinned the Feasibility Study, a techno-rational approach would suggest that excluding it as a feedstock would nullify the original Feasibility Study. Instead, the narrative of linking economies appears to have remained steadfast, embedded within the overarching discourse of an agro-industrial approach, with job creation remaining especially salient. The narratives perform incredibly well by simply being transposed from the original proposals based on potentials in the first economy to the realms of the second economy, where such rationales are in complete contrast to what is realistically feasible.

There is another element to the debate. The importance given towards food-versus-fuel, or rather for or against maize, may be a red herring. While it was important to popular discourses at the time, and certainly worried politicians, the reason the rationale of the strategy remains steadfast is that the BTT would probably be quite happy to disregard maize if it created hassles for them in getting the strategy through Cabinet.

> *From a food security point of view, you need to look at why people took certain positions. The Task Team was looking at, well DME primarily, how [to] sell this to cabinet and what are our [weaknesses]. Maize with its links to food security and not being able to import huge quantities of maize was seen as a weakness in the strategy and then the view taken by the Task Team was that if Cabinet gets upset we just drop maize to get the strategy through* (Former BTT member A, 2012).

Internal Finances and Intervening Factors

A final issue that has thwarted the drive towards industrial biofuels and an important element in the drafting of the final strategy is the interplay of interests and needs within the policy sphere and within the Task Team. Though there were concerns over land, water and crops (amongst others) these appear to have been negotiable from the above discussion. The idea that there is a rational decision that can be taken to support a high-incentive policy as has been suggested by Funke (2010) and was implicit to the biofuels imaginary, does not consider the cost of such incentives. It is assumed that industry would provide the market yet BTT members were concerned:

> *… If you asked the people in South Africa to take part in introducing biofuels you will have a mass strike or something. Politically it's also not really acceptable, somehow you have to carry the costs* (BTT member D, 2010).

This sentiment comes from a senior Department of Agriculture official, who was a member of BTT and, although supportive of biofuels, was critical of whether the strategy and the advocates had presented accurate measures of the costs involved. While Funke suggests that, in his industry-focussed assumptions, incentives are clearly the way forward as these are the way Brazil have achieved their success, these incentives are 'only' one aspect of the equation policymakers needed to decide on, and only make sense if it is only a biofuels industry that you are arguing for. As one Task Team member stated when discussing providing incentives and the costs involved in the biofuels value chain:

> *Once you start dealing with one question all the other things are impacting on this. None of the issues [are] separate. That's one thing, people want to say let's talk about this but you cannot talk about one issue without looking at the other issues as well and the interactions along the value chain* (BTT member D, 2010).

Considering the absence of incentives as a policy failure (see discussion in Concluding Chapter) is unfounded. Incentives were never confirmed officially but rather imagined optimistically, albeit prematurely by biofuels advocates. This respondent also suggested that, although people were quick to see that biofuels plants might pay for themselves, they also needed to be bolstered by the agricultural sector, which could cost up to R6-7billion to ensure sufficient feedstock was made available. That would be a cost borne by government and one they could ill-afford. At the time when the Task Team was considering biofuels, the government was also facing major challenges with Eskom. As the national energy supplier, Eskom, which has a monopoly in South Africa, was unable to meet national power demand due to poor planning as much as anything else (see Appendix E). As the passing of the *final* Strategy neared, it became obvious to at least some members of the Task Team that there would not be available money for both rescuing Eskom and funding (or even powering) large-scale biofuels plants. At the time, there were also plans for a new oil refinery in at Coega, which would lead to an oversupply of fuel in the country. The government would not only be short of funding for new projects but also facing a

surplus of fuel; biofuels clearly take second preference even if industry players were expecting otherwise.

According to this respondent the real challenge, however, is that with so much money being allocated to Eskom, there was little money available to the Ministry of Agriculture - whose budget has been consistently decreasing over the last few years. So while many pundits have been quick to suggest that biofuels projects are easily established, funding biofuels that would effectively allow second economy farmers to become involved is increasingly problematic and unlikely.

Apart from available funds, there are issues around financial planning that extend into the practice of policymaking in general but that were a concern in the biofuels strategy as well. It is one of importance, as the Treasury has been reluctant to support biofuels after the strategy was passed. The fact is that Treasury has been weary of the biofuels strategy, as they have to control what funding is made available across government. But their involvement in policy processes is symbolic on top of it being functional:

> *There is a thing in government as well that, if something goes to Cabinet, they want to show that Treasury has been part of the process. So line departments would often invite you to things so then they can say Treasury was part of the Task Team* (Former BTT member A, 2012).

This, even though Treasury were not entirely in agreement with the basis of the Strategy and weary of the expenses that would be incurred. For this reason too, policies have to be motivated to Cabinet to ensure money is made available. The rational basis therefore becomes less important than appealing to emotive or ideological proclivities to ensure funding becomes accessible.

CONCLUDING DISCUSSION: THE FINAL STRATEGY

This chapter began with a review of two major works that have begun to model (on the one hand) and evaluate (on the other) the development of the final Industrial Biofuels Strategy. I add to this literature focussing more on the social and political

processes involved in the development of the policy document. The synopsis is that the foundational imaginary has broken down as more people have entered into the policy subsystem. Political decisions have also entered the process with politicians having very different perspectives than those crafting the *draft* Strategy and feasibility, whilst much of the underlying discourse has actually remained prominent. The superficial contradictions between the feasibility, *draft* Strategy and *final* Strategy are obvious here. The Feasibility Study ostensibly appears to support biofuels linking the first and second economies, although explicitly states that small-scale farmers are unable to participate in an industrial strategy (privileging the first economy and requiring a separate policy for the second). The *draft* Strategy makes similar assumptions but relies more on the existing commercial agricultural sector (most notably through the inclusion of maize) as the major source of feedstock with token benefits to the second economy. The *final* Strategy departs from both of these, only supporting projects in the former homelands, and most neglected of rural areas. Whereas this latter mandate proposes an admirable pursuit, it does make the prior feasibility redundant (however imperfect it actually was), thus meaning a strategy has been derived with no real sense of viability. While the drivers of employment are important, meeting objectives will be problematic due to the politicisation and resulting contradictions in the *final* Strategy.

The above argument raises the importance of politics or ideology in the policymaking process and how they inform the strategic proposals of the *draft* and *final* Strategies. At the behest of Cabinet, the *draft* Strategy was submitted for public consultation, from which, the *final* Strategy was drafted. This document is regarded by some as being contradictory and more ambiguous than its forerunner and does not actually support the biofuels industry, as was the case earlier. There are a few reasons one might impart to a degree of apprehension expressed within the *final* Strategy (not only the exclusion of maize but relaxed incentives as well). Of the two existing studies of the policy process, Adams *et al.* (2009) go furthest in their critique of the rationales of pursuing biofuels and the conflict that arose between ideas of rural development and the others, such as renewable energy targets, economic benefits and energy security. In this, despite politics trumping economics the lack of support is as much a result of economics as it is anything else. Not only did

politicians feel the strategy was oversold, they were weary that the economics did not make sense and that it would do little to transform the existing rural political economy.

One can also take the findings of Funke (2010) further, as he marginalises the political by constructing the game the way he does, first by only considering three main players (of a Task Team of 12 member departments) and second presenting assumptions as to what would benefit the players themselves *and* the industry (or at least in terms of an industry), not necessarily what would be more important to one or the other. Politicians and members of the Task Team had a far wider range of problems to deal with, with no simple economic answers. This latter issue speaks to rational choice versus ideology and officials in the Task Team clearly recognise the difference. As one Department of Agriculture official lamented of the departments' decision to exclude maize "our policies are ideological, not technical" (National Department of Agriculture Informant, 2010). Funke's 'z' variable therefore conceals the messy reality of policymaking and opens up an interpretative realm. It is the *story* of misinformation, where it comes from, why there would be apprehension towards it and, as is highlighted in the previous chapter how any information is inherently biased, that is important. Therefore, although we have sophisticated models of human decision-making, they err on the side of rationality while leaving open to question why decisions are taken so 'irrationally'. They are also predisposed to an economic logic and modelled on the game developer's assumptions of what each player's understandings are and what their maximum utilities are likely to be. Whether or not it makes economic sense to produce or support the production of biofuels, it may, for example, still not make biofuels 'make sense' politically, environmentally or socially, but are rather competitive or incompatible with wider political objectives each vying for available funds. The importance here is that Funke (2010) identifies the problem as a technical one, with a technical solution, when it is actually a highly political problem and subject to political perceptions and values. Far from this being the exception that proves the rule, political aspirations are a fundamental and foundational aspect to policymaking. Getting political decisions 'right' or 'wrong' is highly subjective and requires, or rather is informed, by a

different set of tools or practices, for example, by wider discourses and their constituent narratives, amongst others.

In my discussion of food versus fuel, I outline first that the debate has actually been an incomplete one (at the technical level) but more importantly that in the policymaking process, it was not the outcome of the 'debate' that actually swayed decision makers in the end. The point here is not to make a value judgement as to whether excluding maize was the right or wrong decision (although the cautionary principle should be exemplified) but highlight the importance of ideology and political processes, which subscribe to prevailing discourses in the face of uncertainty. There is no reason that the decision could not have gone the other way (that is to include maize), or that it will still not happen given the 'right' political support and shifting perspectives of the first and second economy or of the food-fuel-feed system. The decision is then not so much a result of misinformation or about politics trumping economics, it is about both. While there is no doubt vested interests were feeding government biased information, it is important to interrogate again what information or knowledge is credible, which is generally a function of its source as much as (if not more than) the content and is subject to shifting political narratives through which any (mis)information is defined and interpreted. In this case, it was respected politicians of high standing that had insisted that food-versus-fuel was an unnecessary risk informed not by misinformation but by the fact that there was so much misinformation.

The previous chapter has already shown that the process of science (or experts) leading to evidence … leading to policy … leading to implementation is far from what happens. In this latest chapter, it was not that politics trumped economics; it was that the economists were unable to secure political support in the way certain economists would have liked. It is also not a question of misunderstanding the so-called economic as it was politicians with economic backgrounds that made the decision to reject support for maize; National Treasury also had their doubts. While the economics and feasibility are not at all clear, the political economy of South Africa is also not a blank canvas. Although that political economy is dramatically oversimplified in debates over food-versus-fuel or the first and second economy,

they resonate with powerful and emotive ideologies that are reflected in the bargaining of the *final* Strategy. The exclusion of maize thus represents the crucial and complex role evidence plays in policymaking but that its interpretation and use is a function of the political framings, symbolic value at the time and to a certain degree circumscribed within the deliberations of the Cabinet.

It should also be mentioned that the evidence itself played an important (if not complex) role in the departure decision-makers make from those of the biofuels imaginary in general. Prior to feasibility, for example, the job potential was massively inflated to secure political support. Support dwindled after the Feasibility Study predicted 50,000 jobs rather than the 'millions' hoped for. These estimates, while more realistic were also disadvantageous, for politicians at least. Many politicians therefore have turned their back on the policy as "*they were sold a dummy*" (Former DME Official C, 2010). Some respondents have added that Cabinet seemed especially disappointed, which could be considered one of the main reasons for a stagnating strategy. That the policy now seems politically to be a lost cause has not meant its outright demise. In fact, there was already a momentum behind the Strategy, and even if some politicians had grown weary of its implications for employment, there were still enough interested parties sustaining the development of a biofuels industry in South Africa and implementation of the *final* Strategy. It is for this reason that negotiation continues, and the recent promulgation of mandatory blending and amended fuel specifications suggests that the imaginary, its core network of support and most resilient members (or those with financial backing) has allowed for a slow renegotiation. New 'evidence' will be created, new partnerships will emerge, intervening factors will legitimise contrary perspectives and narratives and political decisions will change. In my opinion, decisions will probably shift to support of the original imaginary (though not necessarily the use of maize) for reasons I discuss in the next chapter.

CHAPTER 8: CONCLUDING DISCUSSION

In the previous chapter, I added to the existing analyses of the *final* Strategy and the way in which the contradictions and ambiguities of the *final* Strategy are understood. In this, I have argued that it is not that politics trumped economics but that the political decision was a function of the economic evidence advanced to support the strategy; evidence that was highly generalised and self-serving for the most part. It is also not (only) that industry interests are less influential than political interests are but that politicians (and bureaucrats) have diverse agendas and are not solely subservient to industry needs. I have also argued that one cannot understand the shift in strategy in terms of economic rationality (or irrationality) but that other factors—the meanings policymakers bring to the table and the discursive practices that define them—control decisions, which inevitably includes a politics of evidence and the symbolic value of policy.

Evidence has no clearly defined passage through policymaking. Rather, it is predicated on and interpreted though networks of support and these are in a constant state of flux. As these networks shift through time, so too does their internal power relations and that of the wider decision-making apparatus. Furthermore, evidence is shaped by, legitimised and imparted with (symbolic) significance through underlying paradigms and forms of discursive practice (narratives) within these networks. If such ideas are neglected in policy research, so too is the true nature of policymaking. It is also easy to criticise politics as irrational, but underpinning this is the importance that politics is inherently part of the process. Not only does politics, to a degree, circumscribe what may be acceptable as informative (in ways that need to be interpreted rather than inferred), the supposed rational passage of science or knowledge through policy is also necessarily combined with political oversight. It is not something to be done away with but as one Task Team member suggested "*a necessary evil*". While the role of politics should not be romanticised (it has its own challenges) it cannot be neglected, though in South Africa only limited recognition has been given to the importance of in examining the complex nexus of narratives, networks, power and politics involved in policymaking. In this chapter, I outline the

contributions I make to such a pursuit within the realms of policy research in South Africa.

Examining the development of the biofuels strategy also allows for improved understandings of renewable energy transitions and rural development within South Africa, especially by using the policymaking process (and resultant policies) as a lens through which the battle between competing visions of the future are waged. Importantly, the nature of the biofuels assemblage and the networks of power illustrate a continuing but shifting composition of the MEC, with major players continuing to control fundamental decisions in the industrial sector. While some niche players have emerged, the regime and landscape are controlled to a large degree by existing technological and institutional complexes that have an influence over the (if not any) new technology. By this, what has become the biofuels assemblage has marginalised many niche players, with the 'big four' remaining projects controlled either by foreign capital or the Industrial Development Corporation, which is of direct MEC notoriety. In this, biofuels provide a specific example of wider energy transitions within South Africa, though they differ significantly to other energy sources given their close linkages to the agricultural sector, in which there are also local political-economy factors that add nuance. As (Hansen & Nygaard 2013) highlight, a reluctance towards renewable energy policy may account for stifled developments in the renewable energy niche but this discounts the crucial (if sometimes contentious) relationships that exists between niche players, policymakers and political economy of the regime and landscape.

In discussion of the wider implications of the strategy's development, it is then possible to illustrate how policies 'mean' in South Africa and equally how they 'act'. First, I will reflect back on the initial underpinnings of the research.

REFLECTIONS ON THE AIMS AND RATIONALE

In this concluding chapter, the proposal of Torgerson (1985), in which policy emerges through a dialectic conflict between knowledge and politics, both of which

are subject to cross-cutting forms of power and the discursive practices involved in deciding on ways forward has guided my thinking. Here my research adds to the existing understanding of the biofuels strategy. On the technical side of the spectrum, investigating the biofuels policy brings into focus the (flawed) processes of policymaking in South Africa. It would be wrong to completely trivialise or marginalise the technical aspects of 'good' and 'bad' strategy (though see below for a critique of such labels). If one considers Rumelt's (2011) *Good Strategy Bad Strategy*, it would appear that even the technical approaches to policymaking and strategising around biofuels in South Africa—those embedded within the rationale of evidence-based policy—are deeply flawed. When considering strategy as a diagnosis followed by policies and actions in response as Rumelt (2011) does, there are obvious shortcomings that can be identified. The fact is, when considering the potential of biofuels in South Africa, there was very little diagnosis in the first place. Or rather, much of the diagnosis was neglected or renegotiated to reflect certain perspectives rather than others, no matter how rigorous the analysis was. However, the issue involves far more than just poor planning and a matter of obtaining more or better evidence. It brings into question the very nature of evidence-based policy and the way in which technical problems are framed. This takes us to the political end of the spectrum, where we have a highly variable flux of ideas, convoluted narratives and values driving decisions. Such issues insist we cast a critical view on the reality of policymaking, as was highlighted in the introductory chapter and its aims and rationale.

In the introductory chapter, three main concerns are noted. The first was a reflection on the importance of international discourses and how these encounter, impact on and are taken up by specific actors and networks in local policymaking. Such an approach is equally consistent with the way in which local networks are influenced by and influence the global assemblage within which they are embedded. This is also a theme I have continued to embrace throughout the thesis and has been one reason why I have often reflected on the international situation when discussing emerging themes within South Africa. The importance of international discourses and their counterpart narratives can be seen in the empirical chapters, especially in Chapter 5 in the way biofuels are framed or reframed within South Africa. The allure of

biofuels, created predominantly by European policy directives, is an important part of this but so too are the categorisations and storylines embedded within these proclamations. Energy security, rural jobs and macro-economic savings, amongst others, were reconfigured in South African debates, combined with unrealistic aspirations of uniting the dual economy but were, nevertheless, beacons for the path forward. Although largely unsubstantiated, 'blueprints' for development and frames of reference emerging within the international discourse resonated with interest groups within South Africa, who were quick to respond.

To some degree, the disconnected narratives were contested and underwent some localisation when embraced by policymakers in South Africa but overall the stories informing South Africa's strategy remained familiar. The very power of narratives is in the way they have been easily merged with local interests and are easily motivated in response to what are actually extremely complex challenges. They become especially important for policymaking through 'best practices' and the globalised networks and flows through which they are transplanted to local contexts. Networks and nodes also imply resources (physical and knowledge-based) are concentrated in certain places. An important part of this global-local connection (or Globally Integrated Biofuels Network (GIBN) as Mol (2007) would call it) is the establishment of what I term a biofuels imaginary and surrounding biofuels assemblage in South Africa (see also Birch and Ponte, 2014). The activities of this network of likeminded individuals adds nuance to Mol's (2007) description in that there is perhaps more regional idiosyncrasies (as in Urry's (2003) category of a 'regional network'; see also Appendix D) than the ubiquity and uniform outcomes expected of a GIBN, though there are also similarities. This group, which incorporates local project players and private-sector actors (especially niche players), also includes a close network of policymakers and quasi-government representatives (especially the Industrial Development Corporation and Central Energy Fund) with an interest in agrofuels development, as well as international players, usually financiers and project developers.

The importance of this imaginary is twofold. First, it allows some wider discussions or connections to the emerging renewable energy sector and energy transitions in

South Africa (see below). Secondly, the imaginary is an important set of apparatus through which narratives and discourses gain traction. The funding and gathering of evidence as described in Chapter 6 is one clear example of this.

The biofuels imaginary in South Africa clearly subscribes to practices exported from the United States and Brazil (for bioethanol) and Germany (for biodiesel). The major constraint here is that in attempting to take advantage of global markets (or international development fads), policymakers and project managers alike are 'straight jacketed' within the existing technical and ideological parameters of that market place (not necessarily against their own will). Universalised practices are thus enrolled to justify and legitimise particular biofuels initiatives in local contexts (though, it should be said, also frame objections to them). In South Africa's case, an agro-industrial imaginary has jostled for recognition given their subscription to such universalised practices. There is actually very little room for negotiation outside of the suggestions of existing expertise, even if there has been some local objection. This is important, as, even though early approaches to biodiesel in South Africa emphasised locally appropriate products in addition to an industrial focus, there has been limited inclusion of the former within the emerging strategies. That is, one could argue, after the imaginary had taken shape and solidified their position in controlling the technical development of the strategy. The industrial focus then began to replicate MEC-like, large-scale, modernisation ideologies, even though these are increasingly considered as outdated and impractical for the complex challenges faced within the South African context (e.g. Bond & Ndlovu 2010). Although there is a wealth of criticism against such development practices, my thesis begins to suggest—drawing on scholars such as David Mosse, James Ferguson, James Keeley, Ian Scoones and Harry Jones, who all identify the policymaking realm as critical—that we actually need to unpack the policymaking machinery through which such approaches are continuously replicated. (I look at specific mechanisms in the next section.)

Contextualising the first aim, the second main aim was to interrogate the complexity of policymaking in South Africa, particularly considering what might be meant by the construction of 'good' and 'bad' policy, as this appears to be the prominent

framing of policy debates in South Africa. While highlighting the dominance of *technical* or *instrumental* policy analysis, the consensus is that South Africa has 'good' policies but poor implementation. The institutional diagnostic of the Planning Commission suggests (National Planning Commission, 2011a, p. 23), for example, "more than refined policy analysis, [the bureaucracy] needs people who can get things done". On the flipside, for some time renewable energy policies have been considered quite poor and there remains a need to 'get the policy right'.[1] Given the current level of debate in energy policy specifically, which is transfixed on valuable but overly technical, quantitative and prescriptive studies (Cf. Büscher, 2009), the Planning Commission may in fact be jumping ahead too quickly. Büscher's (2009) critical political-economy approach is an important addition to the literature, in which he explores "power structures that influence both energy policies and the issues of energy equality and sustainability". His perspective begins to illustrate that considering policy as 'good' or 'bad' is fraught with difficulty and perhaps beside the point. In response to the National Planning Commission suggestion, the fact is, a more refined policy analysis might in fact allow us to determine why things do not 'get done' in the first place and moving beyond simple policy analysis, *policy process* analysis can show us why policy and its implementation are not so easily separated or automatically mutually dependant.

My approach and contribution—also being critically orientated—was not to invoke some normative framework or rating exercise but dissect the characteristics of the biofuels policy process in which the outcome, at least in case of biofuels, has been considered 'bad'. Such a situation provides an opportunity to open up the policymaking black-box and peer into some of the dynamics through which policies are made; how certain objectives are legitimised and to consider then what leads to constructions of 'good' or 'bad'. The issue here is one encapsulated in the supposedly vague and contradictory nature (see Adams *et al*. 2009) of the *final* Strategy and its lack of support for the industry. On the one hand, industry pundits and the media were especially quick to suggest the strategy makes no sense. On the other hand, as some policymakers consider the strategy a good one, one can suggest that if policies

[1] South Africa now has one of the largest Renewable Energy Programmes in the world. Whether this is a 'good' thing, i.e. successful, remains to be seen and is a function of the dynamics I discuss in this chapter – one could merely ask to whom the spoils will go.

speak the right language (especially if they reflect alluring narratives that appear unquestionable) they are inherently good, despite the fact that the value-judgement being made reflects specific world-views. Good and bad, for the most part, are a reflection of expectations placed on policies but there are no guarantees and in this case, the biofuels industry lost out; at least in the short term. Good or bad, therefore becomes a relative notion, defined by who is involved, or rather, who is making the judgement, but too quickly substitutes an outcome for 'process'. In this I add to the debate around the biofuels specifically (e.g. Adams *et al*. 2009; Funke & Klein 2011; Funke 2010), and bio-economy more generally, moving past the lament that policymaking is irrational and rather interpreting why this is so. The problem is that many diagnoses trivialise the complexities at work when policies are made. They also marginalise the symbolic value policies may be designed to uphold, in which implementation is only one of the considerations, if at all was.

Further challenges occur at the technical or operational level—the supposed realms of implementation, after a policy has been made. As Mosse (2005) rightly suggests, good policies are generally those that are vague enough to subdue contestation, or that allow existing actions to be reframed in the new policy terms. That is, policy (or policymaking) is an upward-focussed tool for maintaining the legitimacy of interventions, projects work to maintain themselves as coherent policy ideas and discourses are driven by the need to maintain relationships based on existing exigencies. These propositions allow us to consider further the division of good policy and poor implementation—a common proposal made of policies in South Africa. In the case of biofuels, the situation is actually one of supposedly 'poor' policy and what this means for implementation. The full answer requires somewhat an extension of the empirical material provided in earlier chapters and has to consider the shifting terrain of a biofuels assemblage in South Africa. Again, 'poor' has to be seen as a relative notion and is subject to alteration. The biofuels assemblage comprises the remaining hardcore of the biofuels imaginary, but is project-focussed and includes the 'big four' biofuels projects in South Africa. Its importance is current manifest in the increasingly close and advisory relationship they have with policymakers and the slow renegotiation of the 'poor' strategy to meet their requirement. This is a different view of implementation, one that moves the

focus from government making policy and government not having the capacity to implement it, to government (and others) making policy, and then industry, at least those with the backing to do so, slowly reconfiguring technical aspects. The point then is that, while Mosse (2005) suggests good policy may be 'unimplementable', 'bad' policy, for similar reason, might actually be implementable.

The two issues above (good policy versus bad policy and good policy but poor implementation) are closely related and the social constructions of success may be configured around differing perspectives of whether implementation may be taken as *apart* from policy, or *a part* of policymaking. If implementation is considered a separate activity, it becomes easy to judge policy (usually the final document) as an outcome graded according to how well the process of implementation proceeds (even though it is considered a separate activity). Meeting the objectives[2] of the policy through implementation activities implies the strategy must have been successful. If, however, policy and implementation are considered part of the same process, such grading becomes far more difficult and leads to a discussion of co-evolution similar to that in Chapter 4 and hinted at above. One of the main points of my thesis is to illustrate how the two activities may be far more intimately connected or heuristic than is given credence in the South African literature. The biofuels policy was largely developed based on proposals for specific types of project (which were emerging before the strategy was finalised), that is, establishing the needs for a specific form of implementation. When the *final* Strategy did not reflect such interventions but rather espoused politically symbolic proposals, the policy itself was named the failure, though it merely failed a certain group's expectations. At its most practical, grading policymaking may rely too much on what people are already doing, rather than providing new thinking on what they should be doing. Problematising the process, however, insists that it is not only technicalities, such the lack of incentives and mandatory blending that are important. It is the taken-for-granted features making these technical solutions so imperative that need consideration.

[2] It is recognised that, if we are to be instrumental about policy, objectives should be broken down into both outputs and outcomes, though the former is usually prioritised when the latter may be more important.

Here we then need to add to Mosse's (2004; 2005) ideas that policies, mainly through existing interventions and project players, primarily function "to mobilize and maintain political support, that is, to legitimize rather than to orientate practice". While such policies may become the discourse and are successful when they reflect activities on the ground, there is, for example, room to consider who or what dictates what action on the ground is to be in the first place. In some respects then, Mosse (2005) is too quick to criticise Ferguson's (1990) anti-politics machine, as the development apparatus or existing institutional and technological structures of knowledge have an important role to play in justifying and institutionalising certain types of activities, which then inform and draw on certain types of policy. Cross-fertilizing Mosse's work with assemblages (both of which emerge from similar origins) begins to show how there is not neatly distinguishable downward or upward thrust but complex translations, interconnectivities and implications. The situation is perhaps better considered through Giddens's Structuration Theory as has been discussed by Keeley and Scoones (2003) and has been considered as the way through which translations[3] between niche, regime and the landscape occur (see Schot & Geels 2008); though all theoretical perspectives will necessarily simplify the complexity of policy and practice from macro-perspectives and micro-sociological ones. Certainly, the various dimensions of power and mechanisms through which they occur have all been important in various stages and levels of the policy process around biofuels (and not necessarily mutually exclusively). After all, assemblages are the product of multiple determinants that are not reducible to a single logic or process (Ong & Collier 2006) and policy formation within them are equally complex.

There is something also to be said for the way in which, given the vague nature of the strategy, implementation might proceed. As the policy was developed according to what project developers were planning to implement, which again matches practices and programmes in operation in other 'best case' countries—whose policies have all encountered various forms of critique—the successful implementation is

[3] Adrian Smith (2007), for example, suggests three kinds of translations between niche and regime. These include the way problems in the regime inform the guiding principles creating the niche, reinterpreting elements of socio-technical practice in the niche and inserting them into regime settings, or modifying the niche in the light of lessons learned about the regime and finally to translations that alter contexts, i.e. changes that bring the regime closer to the situation that pertains in the niche, or vice versa.

something that remains to be seen in the South African context and a remaining issue to be investigated. The initial signals are not promising. The overall strategy still follows an industrial logic replicating highly subsidised and incentive-based markets in which, despite all the associated development rhetoric, 'implementation' has become focussed on resolving legislative requirements to make producing biofuels feasible, rather resolving the contradictions (political aspirations versus technical approaches) that the strategy has tried to accommodate and ameliorate (largely unsuccessfully). The changes proposed thus far are technical concessions to be made, not rearticulating (or clear articulations) of what the government aims to achieve and whether the decisions being made about biofuels actually reflect the potential of biofuels to achieve them, let alone getting to grips with how those ideas came about in the first place.

While a great deal of attention is given towards technical fixes to ensure policies are implemented, far less is given to how the decision forward was made and whether this may be the problem itself. Even in the current policy negotiations, although some projects have shifted to different crops—notably Mabele now basing operations on sorghum instead of maize—they continue to mobilise support for the industry to match that of the original biofuels imaginary. Given the recent consultations around mandatory blending, clean fuel specifications (as well as support structures and cost structures being established), the continued lobbying seems to have achieved some success.[4] Again, this speaks to the importance of interrogating the *process* of policymaking (rather than only looking at its outcomes). This is the third main concern outlined in the introduction, and is considered next through the key theoretical framework established in Chapter 2.

Key Theoretical Themes Revisited: Narratives, Networks, Institutions and Politics

In South Africa, I have shown that the activity of policymaking is generally excluded from discussions of policy failure. The National Development Plan (National

[4] It may not actually be the lobbying that is important but rather a shifting political commitment to green development, emerging from COP17 and related commitments, which have provided a legitimizing platform for technologies such as biofuels.

Planning Commission 2011c), for example, as the most recent and comprehensive analysis of the South African politico-administrative situation, suggests that plans are only as credible as their implementation strategies, which often fail when implementation does not happen or does not happen uniformly. The nearest the Plan comes to dissecting policymaking as a possible cause of frustration is the acceptance that when consultants are brought in to develop policies, they may increase the gap between policy and its implementation.[5] Policymaking is, however, about mediating arguments, and in South Africa, there has been limited examination of how such arguments differ according to the knowledge (and ideas) used to support them. In the case of biofuels, I have already argued above for the importance of international discourses in constricting the perceived options available whilst local narratives impart symbolic value to decisions made. I engage with some further issues below.

The discussion within the theoretical chapter culminated in a few themes that consistently emerge across the various frameworks and models of the policy process and the way certain 'knowledges' are used to make decisions or become the basis for policy. Principal among these is the importance of politics (that is the distribution of power over decisions, arguably according to one's own interests and ideology), institutions as both the formal rules of the game and processes of socialisation (rules in use), the importance of networks (through which power is distributed and manifest) and the discourses and narratives through which arguments are made (and that reflect received wisdom and existing power structures). Their importance to the South African context is validated by the empirical material of the previous chapters. Complicating the situation, however, is that none of these themes should be taken to be mutually exclusive but rather work through and influence each another directly and indirectly. It is the nuances of where, when and how they interact—the context of action—that provides the most incisive conclusions to be drawn.

The early stages of the policy's development, at least after principles of government 'protocol' meant, institutionally, that the DME had taken control of the strategy's

[5] It is worth recognising that, as important as it is, the National Development Plan is itself the collective output of academics and consultants rather than an articulation of government or reflective of what is actually possible. It is a ‘to do’ list with little in the way of how government is going to actually do it given previous failures.

promulgation, allowed for a concentration on large-scale industrial approaches. These were legitimised, if not circumscribed by international best practices that easily, through the universality of 'win win' narratives, matched with local political and socio-technical imaginaries. Proposals for job creation in the 'second' economy (which is itself a problematic social construction of the rural political economy in South Africa) were sold alongside or as justification for new markets and related schemes in the 'first' economy. While there have been institutional and personal influences, actors and networks pursuing material interests are equally important in the link between knowledge and policy and the creation or influence of power-knowledge. These actors and networks, a discrete agro-industrial imaginary in the early stages, were important in defining the extent and nature of evidence, which, when matched to existing political narratives would begin to inform policy based on their aspirations and plans. It is not that this necessarily leads to 'bad' practices (this is often how policies are made) but the resultant social construction has built into it several properties that may, dependant on other factors, limit the development of flexible and dynamic forms of regulation and programming that include and benefit local needs. Such tensions, however, are hidden rather than resolved within the strategy documents. Even the final strategy, as an 'industrial' strategy but based on the 'second' economy, suggests that political decisions too, become imbedded within specific frames of reference.

The links between these frames of reference and decisions made are not necessarily direct and they are subject to certain amounts of change. The Feasibility Study and its translation into the *draft* Strategy is one indication of this complex link between evidence and policy (or rather politics). Even though the evidence provided in the Feasibility Study is highly questionable (there is little statistical justification for biofuels), it appears less important than the political narratives through which such evidence is interpreted and legitimised. While it was possible to contain contradictions between the agro-industrial approaches and developing the first and second economies in the *draft* Strategy (which had survived some political objection but was generally supported) such contradictions would not survive new politically sensitive narratives of food-versus-fuel. Such legitimisation and rejection is then a function of interpretive networks, though it must be noted that these networks are not

easily delineated and are in continual flux. It is unhelpful, for example, to suggest that politicians refused to support maize in the *final* Strategy. It was 'some' politicians who took an emotive stance given their own experiences and perceptions. While there was significant political support for biofuels through ASGISA, these shifted dramatically with outspoken fears of a food-versus-fuel crisis, spurred on by an international controversy and politicised by a select few ministers.[6] The origin of an 'anti-maize for biofuels' lobby within the Cabinet and Treasury is especially important given the centrist tendencies of the government and the power these decision-makers wield in policymaking (see Chapter 3).

Networks of a more technical or project orientation—the agro-industrial imaginary itself—are far more clear, though also not necessarily stable. The IDC and CEF, as well as some officials from the DME and DTI were the hardcore (though the IDC and DTI are now seemingly the central players), but others, the maize lobby for example, have been somewhat marginalised in the policy process. Whereas this lobby was important in instigating and publicising the proposed benefits of biofuels, they found themselves on the wrong side of a discursive and material divide. Not only were they seen to be too 'white' and thus politically outcast given their preferential treatment during apartheid (and resulting dominance in the rural economy), they were victims of what may have been an overly emotive food-versus-fuel debate. Whether or not the debate was rigorous, the strategic vision of Bernstein's (2004) *Boys from Bothaville* has once again outstripped their political strength. They have had limited ability in assuring government that food security would be maintained, with the ANC-led government remaining highly sceptical. Decisions therefore became ideological, in much the same way, one could argue, as they were during apartheid, although this time it was subsistence farmers in the second economy that captured the political imagination. Whether requisite capacity to support such farmers in the same way the National Party supported farmers during apartheid remains to be seen.

[6] The dramatic axing of President Thabo Mbeki (and the exodus of his supporters – Phumzile Mlambo-Ngucka included) would further isolate biofuels in political decision making.

The shifting political terrain and emerging networks is an important feature of policymaking and the empirical chapters begin to show why. Although new players have entered the game, the hardcore of the biofuels imaginary suggest that policymaking at a technical level is circumscribed by specific frames of reference, especially those emanating from the industrial modernization and technological fetish of the MEC. They are, however, finding greater political resistance or, rather, increasingly in contrast to the political vision. Such dynamics require further interpretive investigation in areas outside of biofuels but remain a central feature of policymaking, not something to be regarded as irrational. As Du Toit (2012) notes, evidence-based policy falls into a narrow centrist conception and misunderstands the importance of politically and ideologically loaded 'policy narratives' and research findings. This thesis has incrementally adds to Du Toit's (2012) critique of evidence-based policy, suggesting also that it is not only the call to evidence that is a concern but the networks involved in its development, the discursive structures through which it is interpreted, as well as the wider activities of networks and elites that have to be factored in (see Chapter 6). Furthermore, it suggests that while there may be some value in categorising policy types (e.g. Khosa 2003) there is value also in considering how even apparently technical or technocratic decisions are highly politicised and representative of existing tensions in South Africa's development, both past and present.

HOW DO POLICIES 'MEAN' IN SOUTH AFRICA?

As Yanow (1996) reflects in her book of 'how policies mean', policies are expressive of identities and societal contexts in which they are developed as much as they are instrumentally orientated. Similarly, policies themselves can display their own agency much as inanimate objects do within actor-networks. Drawing on the above discussion and the empirical material of the previous chapters, it is possible to examine some of the ways in which policies reflect nuances of the South African socio-technical and political context and have their own agency beyond any supposed instrumental effects.

In brief, there is an interesting trajectory emerging from my analysis of the development of the final strategy. Not only does the national picture look very different to existing descriptions but also there are forgotten developments at the provincial level. The similarities in the types of narratives and supporting evidence, the reach of core networks (especially the various 'development corporations') and political persuasions suggest that policymaking is well beyond the grasp of the wider citizenry and participatory policymaking is marginalising, at best as a function of representative policymaking and, at worst and increasingly likely, is subject to the whims of 'experts' and the requirements of capital. Furthermore, projects are a crucial if not foundational element of the policy stream at provincial (and to a degree national) level and yet are too quickly excluded as part of policymaking within the existing literature. Policies are co-produced through networks within the policy subsystem – projects are not only situated at the implementation end of the spectrum, they are embedded within the decisions as to what that implementation should look like and are central to knowledge creation processes through which policies are derived.

Returning specifically to the national level, in my critique of the Feasibility Study, I attempt to answer emerging questions of how expertise informs policymaking and what evidence is used in deciding. As has become increasingly apparent in my research, the South African situation reflects wider criticisms of evidence-based policymaking (EBP) or New Public Management (NPM) in the North. As Bond (2005) illustrates for the Reconstruction and Development Plan (NDP) and scenario plundering therein (see chapter 3), the technocratic power-structures through which policies are made and evidence is produced and legitimised are likely to be more rationally deficient than EBP discourse tends to propose. That is, in a practical sense the evidence buttressing the win-win biofuels narratives is not important so much for its accuracy or robustness—questionable as it is and evidence is increasingly becoming partial when confronted by complex problems—but in its potential to justify policy-based proclamations. Digging deeper, the research also highlights dubious assumptions about the value of evidence in policymaking, showing that the evidence does not speak for itself it is spoken for. What is especially interesting is that whilst the evidence put forward was clearly controversial amongst some interest

groups and academics (with little platform to air such disagreement), it was not considered problematic politically or within the networks of support; the same networks with close linkages to the policymaking apparatus of government and part of the biofuels imaginary in South Africa. Being funded by the Central Energy Fund and the Industrial Development Corporation, the feasibility was imbued with an industrial logic from its initiation – the questions investigated as part of the evidence-gathering being clearly loaded but through the apparent credibility of providing 'evidence' their answers were still able to achieve consensus and legitimacy.

Although there has been some work on renewable energy transitions in South Africa, in this thesis, my framing of a biofuels assemblage, with a biofuels imaginary being central to policymaking (though not in simple ways) begins to highlight the important power dynamics and the most forceful actors within the struggle to define South Africa's future energy outlook. What is novel about biofuels is that the transport-fuel energy system with which it interacts differs markedly to the electricity supply sector and so offers a new arena in which to investigate the existence and nature of Minerals-Energy Complex. Although renewable energy in general is seen as an alternative to the hegemony of Eskom, it is still subject to the existing political economy in which Eskom holds considerable control. Similarly, when considering biofuels, though it was considered initially to represent a green alternative, the realisation is that this is unlikely from a range of perspectives. However, what I am most interested is the close connections between the state and industry when it comes to policymaking around major developmental technologies. The clean energy transition is then representative of the MEC, though with some new players and a shift in the energy source. Similar entities in control of the transition as were present in the original developments around coal, which includes coal-liquid and gas-liquid synthetic fuels. Ultimately, from the initial development of the biofuels strategy, a capital-intensive technological fetish seems to be consistent across both the National Party during apartheid and democratic ANC government.

Biofuels are equally novel for their potential role in the agro-economy. My research illustrates, however, how old forces within the agro-industrial sector are encountering new gatekeepers. Despite the dramatic shifting of support for maize-to-

ethanol plants in the country (particularly the Free State Province—South Africa's breadbasket), however, there has actually been little shift in rural development paradigms or discourses in the country. Acquiescing to a 'dual-economy' logic has perhaps sharpened the focus (even if it is a misleading construction; see Appendix E), but agricultural solutions continue to be crafted in ways unlikely to achieve success in 'bridging' the first and second economy. For the most part, they ignore the unlikely success of new entrants and default to plans in which only the existing large-scale and well-financed players will be able to succeed. While ecological modernisation is pandered to, economic reality is completely ignored or unrealistically inscribed within 'pro-poor' and job-creation rhetoric. Given the complexity of land reform and rural economies in South Africa, policies remain contentious and politically motivated, with job creation a particularly powerful symbol and hence totally amenable to 'biofueled' discourses of rural development. Unfortunately, this is unlikely to help those that need it the most. Banning maize, for example, is extremely myopic given the potential to grow it in the former homelands, but what is more important is that such potential has been marginalised from policy decisions given the overriding ideologies and prevailing narratives, though given the circumstances makes sense (at least politically).[7] Equally important is the range of actors that the supposed 'quick-fix' solution of biofuels brings together—a cohort not unlike those of the MEC above and similarly important in the configuration of the biofuels assemblage in South Africa.

Whilst highlighting emerging networks and power dynamics within policymaking around biofuels, my thesis argues that narratives have become like glue, holding together disparate interests, though local complexities and politics can subdue, rearticulate and renegotiate the terms and status of such narratives in complex ways. They also allow a re-articulation of what has gone before, and can be used to legitimise existing failures, reconstructing them as political successes, a neat rhetorical trick used in many instances to continue along predetermined or existing

[7] An important element of this situation is how biofuels brings to the fore the racial tensions in farming in South Africa and, through various farmers/farmer types grappling with biofuels, how policymaking is (or rather is not) localised in the country. The outcomes of the policy also create a point of reflection for farmers as to which ones are acceptable, and which ones seem to be marginalised. While white commercial farmers are seemingly indispensible for food production, they are political outsiders.

pathways no matter the likelihood of success and the potential for developmental benefits upon which policies are proposed.

The above is then particularly important as part of a reflection of the development state South Africa considers itself to be. A first issue is the way in which policymaking in the country is perhaps unequal to the task of South Africa becoming a developmental state.[8] The rhetorical and discursive practices of policymaking in South Africa appear to undermine and overshadow the ability to accommodate complexity. Centralising and over-politicising decision-making means that policies have to remain vague and open to interpretation. Through successive drafting of the biofuels strategy, this has become increasingly apparent. While I cannot deny that the vague nature of the policy has been detrimental to the industry, it is almost a necessity for policymakers, in that it allows for multiple interpretations and leeway in a complex, fluctuating and largely unknown arena, as well as allowing for political point scoring. That is, vague policies are still important for their symbolic value regardless of their practical value. Such a feature is well recognised of policies in general and, while the vague and contradictory nature of the *final* Strategy may be problematic, it may not be very surprising.

> *So it's not about if it's going to work or not, it's about how good it looks, it has to be vague, if it's too detailed then Cabinet doesn't look at things to start off with, I mean we took Cabinet proposals and they wouldn't consider it because it's too technical so there's a definite shortfall* (Former BTT member A, 2012).

As a particularly complex policy option, with the promises of biofuels engaging with multiple and complex systems that are still not fully understood, the BTT have been unable to produce a policy that articulates clearly how it foresees biofuels as a developmental tool in anything other than through existing political conceptualisations of development in South Africa. In this, the veil of policy allows both the fashioning and legitimisation of discourses that do not fit with 'reality'. In facing multiple challenges, which have been uncomfortably merged with the aims and aspirations of a select network, the industrial biofuels policy is trying to achieve

[8] Common to most Development States are technocratic policymaking with strong leadership both politically and institutionally (usually with a lead agency) with an associated meritocracy or highly capacitated civil service.

multiple ends through a single technological means. Even though such political ends may be contradictory, they make for appealing rhetorical commitments even if unachievable in practice. Policies are used to 'politicise' technical solutions, moving them from the realms of the technical and making them operable in the understandings and imaginations of politicians and practitioners. An overarching anti-intellectualism in particular appears to offer fertile ground for homogenising narratives to be sown and symbolic policymaking to proliferate; denying not only the potential value of new technologies but removing the potential for politics from below.

There is also an existing argument that there is the inability to counter elitist and hegemonic ideologies, which in turn cast a shadow of doubt on the ability of South Africa to realise its potential as a developmental state responding to the needs of its poorest citizens. This too can be seen in the biofuels policy, in which appeals to the development objectives have to be seen in the face of the underlying discourses and external influences through which the strategy has been developed. While it is easy to emphasise the importance of political processes and citizen engagement in policymaking, such suggestions overlook the less overtly political but increasingly influential channels generally not open to the poor and marginalised. Socio-technical imaginaries with close links to policymakers have eliminated politics from below and closed out exactly who can participate within the policy process, especially in its early phases in which policy frames are established and issues are made politically relevant. As policymaking is also an on-going process, it is difficult for NGOs and civil society to compete with players that are more powerful (i.e. resourced), especially through time.[9] Continued involvement by such players includes shaping public opinion through the media and persistent promotion, sustained economic pressure through lobbying (at its extreme taking the form of threats of economic collapse) and a range of informal social networks that influential elites are able to establish. In so doing, an imbalance of who counts in policymaking and the value of

[9] There are equally interesting dynamics around NGOs in South Africa. They lack of resources appears to direct their attention to ‘what's hot’ and subsequently there is an inherent weakness in that business is able to lobby for its interests as a core function of what they do. In the early stages of the policy process, biofuels were hotly debated, in later (and arguably more important) consultations, there has been very little objection.

the knowledge they add to the negotiation persists. Whereas Evans (2010) suggests that development strategies cannot be formulated by technocrats but must be derived from democratically organised public deliberation, this seems to depart from existing practices. Additionally, although many developmental states rely on technocratic decisions, the more important issue seems to be the knowledge they bring to the table and whether it is fashioned towards a greater good or material self-interest. (The same is true of political oversight.) At worst, the biofuels policy appears to be representative of an anti-democratic and anti-development state, considering the conceptual apparatus of a developmental state (participatory policymaking, accountability, benefiting the poorest of the poor, *et cetera*.) through which these are defined earlier.

Finally and summarising the above, we need to look at policymaking within the wider processes of government and what it attempts to achieve within such processes. There are, of course, instrumental effects to policies and strategies, in which they guide the course of action and present outcomes to be achieved. They may also act in other ways. Two aspects come to the fore when considering biofuels. First, the allure of biofuels as a development solution has legitimised biofuels in the first place and has become a mobilising metaphor justifying or rendering achievable other plans of action, despite limited evidence to suggest this is possible. The use of the biofuels to reframe existing betterment-style programmes in the Eastern Cape highlights such a situation. The use of the biofuels policy as a mobilising metaphor can also be seen in its use within policies and political statements after its initial promulgation. The Industrial Policy Action Plan (IPAP) provides one example of this, in which accelerated development in the biofuels sector is a key action plan. Interestingly, it specifically mentions biodiesel and support for the canola project in the Eastern Cape with little specific mention of any of the other projects. The involvement of the DTI, as the lead department developing the IPAP and a significant investor in the canola project, makes this understandable. According to this plan, it is assumed that the biofuels sector will lead to up to 150,000 jobs created (Department of Trade and Industry, 2010 p.70). That is three times what the original Feasibility Study suggested. Again, 'win win' narratives are consistently used as a justification for prescribing particular approaches to rural development through the

development of the biofuels value chain. Such interventions are based on particular constructions of the rural economy, which make these solutions an obvious and logical choice.

Political statements surrounding biofuels after the strategy has been passed and the industry remains in disarray, suggests another way in which policies 'mean' – the most notable occurring at COP17. In a keynote address, the Minister of Energy suggested that the pilot strategy had been a success and South Africa had resolved regulatory challenges surrounding biofuels. Yet, neither was there regulations established within this period, apart from rudimentary licensing criteria, nor was any biofuels produced during this pilot stage. It is in such pronouncements that the symbolic utility of policies becomes most pervasive.

The development of a strategy has practically become a measure of success rather than or in addition to being a plan of action to achieve success. We have to accept that sometimes policies (rightly or wrongly) are commitments to inaction as much as they are commitments to action. The blurry distinction between a strategy and a policy is an important part of the symbolism associated with strategies. I am at fault as I too have used the terms strategy and policy quite loosely, owing to the fact that definitions of policy are themselves quite broad. Although the proposition that a strategy is a purposive course of action (or inaction), or declaration and plan justifies my position, in government, however, the distinction is far more important and yet little understood. The terms are also used interchangeably as part of government praxis. The challenge, however, is that the two terms come with somewhat different levels of accountability to implement and are thus differing types of policymaking. Policies (ideally) are institutionally regulated (especially in the form of white papers) and thus impose greater accountability to implementing agencies (though people differ in their opinions of this). Strategies are also easier to change and adjust, which is both necessary and problematic. It means government gives itself leeway when developing strategies but leaves open the question of whether a strategy can become a policy or will receive the institutional backing that policies do. Of course it is also open to question whether there is any definitive difference as cases of policies not being implemented abound, which seems to suggest, once again, that policy means

far more than just instrumentally defining 'implementation'. It is thus I suggest that we need to interrogate how policies mean whilst also reflecting on how they act.

Final Words

The core contribution I seek to make in this thesis is that there is a need to review the types of discourses and narratives at work and how they are reflected in policy and policymaking in South Africa. The similarities of the provincial and national policies, which certainly spoke the same language for reasons already mentioned, seems to suggest there is value in interrogating these issues further in other areas, especially where industrial and highly technological policies and plans are being formulated. Similarly, the networks involved in the two strategies are equally alike, again reflecting a core imaginary within wider assemblages. The IDC has become particularly important here and its influence is thus significant. How this extends to areas other than biofuels requires greater empirical attention. While much attention has been given to who holds the power politically in South Africa, there is more to be said about the composition of the 'elites' and how these quasi-governmental (not quite government, not quite private sector) entities operate within policymaking and policy implementation. They may turn out not to be the tools that government or the public assume they are (or more worryingly and more likely, they are, and everyone else is being misled). The above conclusions also unjustly generalise the minutiae of policymaking; though all such studies of the process will be necessarily imperfect and neglect considerable detail; reality always exceeds our analysis of it. Just as so-called blueprints hypostatise development contexts and remain incomplete, so too will interpretations of how such narratives inform policy and the dynamic processes that occur thereafter. Drawing on other peoples experiences adds further filtration but does allow for an informative interrogation of the process nevertheless.

In closing, the use of biofuels and the resulting biofuels policy appears a good example of what we think modernity and science/ technology as a development solution is, and why it is so problematic. While presenting seemingly imaginable even if far-fetched solutions, these solutions are delinked from the structural nature of poverty that is constantly overlooked by bold policies and abstract narratives.

These too are a function of power and knowledge. As Jones (2009) highlights, while multiple theories of power and the knowledge policy interface in the policy process are fairly well established, they have not yet been consistently applied in Southern contexts. As such, it is not possible to say if/when one dimension plays the strongest role in shaping policy in development, which sorts of actors play the more prominent roles, what are the key institutions, or the pertinent discursive structures or practices. While the quest for an overarching theory of policy may be doomed, our understanding is still far reaching and there is no reason the interpretive project especially should not be extended within South Africa scholarship. This thesis has presented an original if only initial exploration into the South African context, far more remains to be done to expand interpretive studies of policy into a large-scale empirical project, focussed on supposed development solutions other than biofuels but those equally as important and provocative.

REFERENCES CITED

ABB, 2011. *South Africa Energy Efficiency Report*, Johannesburg: ABB.

Adams, G., 1981. *The iron triangle: the politics of defence contracting*, New York: Council on Economic Priorities.

Adams, N. *et al.*, 2009. *Biofuels and the Rural Poor in South Africa*, Council for Scientific and Industrial Research: Pretoria.

Adelzadeh, A. & Padayachee, V., 1994. The RDP White Paper: Reconstruction of a Development Vision? *Transformation*, (25), p.18.

Adrian Hadland, 2007. Searching for Mbeki's Second Economy. *NGO Pulse*. Available at: http://www.ngopulse.org/article/searching-mbeki%E2%80%99s-second-economy-adrian-hadland [Accessed February 19, 2013].

Africa Research Institute, 2007. *South Africa: The Brazil of Africa*, London: Africa Research Institute.

African Centre for Biosafety, 2008. *Agrofuels in South Africa: Project, players and poverty*, Johannesburg: PressPrint.

African Centre for Biosafety, 2011. *South Africa's Agrofuels Industry: A non-starter?*, Johannesburg: PressPrint.

Alexander, M., 2005. Ethanol Africa: clean maize fuel - SouthAfrica.info. *SouthAfrica.info*. Available at: http://www.southafrica.info/about/sustainable/ethanol-120905.htm [Accessed March 2, 2012].

Aliber, M., 2003. Chronic Poverty in South Africa: Incidence, Causes and Policies. *World Development*, 31(3), pp.473–490.

Aliber, M., Baiphethi, M. & Jacobs, P., 2009. Agriculture Employment Scenarios. In *Another Countryside? Policy options for Land and Agrarian Reform in South Africa*. Pietermaritzburg: University of Natal Press, pp. 133–161.

Amezaga, J., Von Maltitz, G. & Boyes, S. eds., 2010. *Assessing the Sustainability of Bioenergy Projects in Developing Countries: A Framework for Policy Evaluation*, Newcastle: Newcastle University.

Amigun, B., Musango, J.K. & Brent, A.C., 2011. Community perspectives on the introduction of biodiesel production in the Eastern Cape Province of South Africa. *Energy*, 36(5), pp.2502–2508.

Anderson, J., 1997. *Public Policy Making* 3rd ed., Boston: Houghton Mifflin.

Anon, 2006. Africa's first bio-ethanol plant. *25 Degrees.net*. Available at: http://www.25degrees.net/index.php/component/option,com_zine/Itemid,123/id,329/lang,en/view,article/ [Accessed March 2, 2012].

Anon, 2007. Draft Eastern Cape Bio-fuel Policy.

Ariza-Montobbio, P. *et al.*, 2010. The political ecology of Jatropha plantations for biodiesel in Tamil Nadu, India. *Journal of Peasant Studies*, 37(4), pp.875–897.

Arturo Israel, 1987. *Institutional Development: Incentives to Performance*, Johns Hopkins University Press. Available at: http://www.alibris.com/Institutional-Development-Incentives-to-Performance-Professor-Arturo-Israel/book/3252304 [Accessed July 17, 2013].

Asgisa-EC, 2009. *Asgisa-EC Strategic Business Plan 2009-2014*, East London: Asgisa-EC.

Austin, G., 2006. Review of the Terms of Reference entitled "An Investigation into the Feasibility of Establishing a Biofuels Industry in the Republic of South Africa."

Ayee, J.R.A., 2013. The Developmental State Experiment in Africa: the Experiences of Ghana and South Africa. *The Round Table*, 102(3), pp.259–280.

Babbie, E.R. & Mouton, J., 2001. *The Practice of Social Research*, Oxford University Press Southern Africa.

Bachrach, P. & Baratz, M.S., 1962. Two Faces of Power. *The American Political Science Review*, 56(4), pp.947–952.

Bailis, R. & Baka, J., 2011. Constructing Sustainable Biofuels: Governance of the Emerging Biofuel Economy. *Annals of the Association of American Geographers*, 101(4), pp.827–838.

Baker, L., Newell, P. & Phillips, J., 2014. The Political Economy of Energy Transitions: The Case of South Africa. *New Political Economy*, 0(0), pp.1–28.

Balat, M., 2007. An Overview of Biofuels and Policies in the European Union. *Energy Sources, Part B: Economics, Planning, and Policy*, 2(2), pp.167–181.

Banerjee, A., 2011. Food, Feed, Fuel: Transforming the Competition for Grains. *Development and Change*, 42(2), pp.529–557.

Banks, D. & Schäffler, J., 2006. *The potential contribution of renewable energy in South Africa*, Johannesburg: Sustainable Energy & Climate Change Project. Available at: http://projects.gibb.co.za/Portals/3/projects/201002%20Nuclear%201/Append

ix%20D%20Public%20Participation/App%20D8/potential%20of%20RE%20in%20SA%20Feb06.pdf [Accessed March 8, 2013].

Banse, M. *et al.*, 2008. Will EU biofuel policies affect global agricultural markets? *European Review of Agricultural Economics*, 35(2), pp.117–141.

Bauer, R.A., 1968. The Study of Policy Formulation: An Introduction. In R. A. Bauer & K. J. Gergen, eds. *The study of policy formation*. Free Press, pp. 1–26. Available at: http://books.google.co.uk/books?id=GdKxAAAAIAAJ.

Beddington, J., 2009. World faces "perfect storm" of problems by 2030 | Science | guardian.co.uk. *Guardian.co.uk*. Available at: http://www.guardian.co.uk/science/2009/mar/18/perfect-storm-john-beddington-energy-food-climate [Accessed December 17, 2009].

Beinart, W., 2008. *The rise of conservation in South Africa : settlers, livestock, and the environment, 1770-1950*, Oxford: Oxford University Press.

Bekker, B. *et al.*, 2008. South Africa's rapid electrification programme: Policy, institutional, planning, financing and technical innovations. *Energy Policy*, 36(8), pp.3125–3137.

Beniger, J., 1986. *The Control Revolution: Technological and Economic Origins of the Information Society*, Cambridge Mass.: Harvard University Press.

Bernstein, A., 2007. Skills, Growth and Migration Policy: Overcoming the fatal constraint. *CDE In-depth*, (5), pp.1–55.

Bernstein, H., 1992. Poverty and the poor. In *Rural Livelihoods*. Oxford: Oxford University Press, pp. 13–26.

Bernstein, H., 2004. The Boys from Bothaville, or the Rise and Fall of King Maize: A South African Story. *Journal of Agrarian Change*, 4(4), pp.492–508.

Bernstein, H. ed., 1996. The political economy of the maize filliere. In *The agrarian question in South Africa*. London: Frank Cass, pp. 120–145.

Bevir, M. & Rhodes, R., 2003. *Interpreting British Governance. London, Routledge*, London: Routledge.

BFAP, 2012. *BFAP Baseline Agricultural Outlook 2012-2021*, Pretoria: Bureau for Food and Agricultural Policy. Available at: http://www.bfap.co.za/FINAL%20Agricultural%20Outlook.pdf [Accessed December 18, 2010].

BFAP, 2008. *BFAP Biofuels Report 2008: Impact analysis of the Biofuels Industrial Strategy on the South African Agricultural and Biofuel Subsectors*, Pretoria: Bureau for Food and Agricultural Policy.

BFAP, 2007. *Modelling the impacts of macroeconomic variables on the South African biofuels industry*, Pretoria: Bureau for Food and Agricultural Policy.

BFAP, 2010. *The South African Agricultural Baseline*, Pretoria: Bureau for Food and Agricultural Policy. Available at: http://www.bfap.co.za/FINAL%20Agricultural%20Outlook.pdf [Accessed December 18, 2010].

BFAP, 2006. *The South African Agricultural Outlook*, Pretoria: Bureau for Food and Agricultural Policy. Available at: http://www.bfap.co.za/FINAL%20Agricultural%20Outlook.pdf [Accessed December 18, 2010].

Bhorat, H. & Kanbur, R., 2006. Introduction: Poverty and well-being in post-Apartheid South Africa. In *Poverty and Policy in post-Apartheid South Africa*. Johannesburg: HSRC Press.

Bilinsky, P. & Swindale, A., 2005. *Months of inadequate household food provisioning (MIHFP) for measurement of household food access: indicator guide*, FANTA.

Biofuels Task Team, 2006. An Investigation into the Feasibility of Establishing a Biofuels Industry in the Republic of South Africa. Available at: http://www.dme.gov.za/pdfs/energy/bio_feasible_study.pdf [Accessed November 23, 2009].

Biopact Team, 2006. A closer look at Africa's "Green Opec." *Biopact*. Available at: http://news.mongabay.com/bioenergy/2006/08/closer-look-at-africas-green-opec.html [Accessed July 12, 2013].

Birch, K. & Ponte, S., 2014. Biofueled futures: governance and imaginaries of an emerging bio-economy. *Environment and Planning A*, 46, pp.271–279.

Birkland, T.A., 2001. *An introduction to the policy process : theories, concepts, and models of public policy making*, Armonk, N.Y.: M.E. Sharpe.

Blanchard, R. *et al.*, 2011. Biofuels and biodiversity in South Africa. *South African Journal of Science*, 107((5/6)), p.8.

Boamah, P., 2010. Competition between biofuel and food? Re-thinking Biofuel Narratives, evidence from a jatropha biodiesel project in Northern Ghana. In *Biofuels, land grabbing and food security in Africa*. London: Zed, pp. 129–144.

Bohensky, E. *et al.* eds., 2004. *Ecosystem Services in the Gariep Basin A contribution to the Millennium Ecosystem Assessment, prepared by the Gariep basin team of SAfMA, the Southern African Millennium Ecosystem Assessment*, Stellenbosch: SUNPress.

Bond, P., 2005. *Elite transition: from apartheid to neoliberalism in South Africa*, Sctosville [South Africa]: University of KwaZulu-Natal Press.

Bond, P. & Ndlovu, M.M. ka, 2010. Development Dilemmas of Mega-Project Electricity and Water Consumption. In B. Freund & H. Witt, eds. *Development dilemmas in post-apartheid South Africa*. Scottsville, South Africa: University of Kwazulu-Natal Press.

Borras, S., McMichael, P. & Scoones, I., 2010. The politics of biofuels, land and agrarian change: editors' introduction. *Journal of Peasant Studies*, 37(4), pp.575–592.

Breytenbach, W., 2010. The Political Environment for Agribusiness in South Africa during the Next Decades. In Agriculture Business Chamber Congress. Sommerset-West: Agriculture Business Chamber.

Bridgwater, T., 2006. Biomass for energy. *Journal of the Science of Food and Agriculture*, 86(12), pp.1755–1768.

Britton, J., 2007. Categorising and policy making. In S. Hodgson & Z. Irving, eds. *Policy reconsidered : meanings, politics and practices*. Bristol, U.K.: Policy Press, pp. 61–79.

Brock, K., Cornwall, A. & Gaventa, J., 2001. *Power, knowledge and political spaces in the framing of poverty policy*, Brighton: Institute for Development Studies.

Bruggemans, C. & Slabbert, F. van Z., 2003. *Change of pace: South Africa's economic revival*, Witwatersrand University Press.

Bryceson, D., 1996. Deagrarianization and rural employment in sub-Saharan Africa: A sectoral perspective. *World Development*, 24(1), pp.97–111.

Bryceson, D., 2000. *Rural Africa at the crossroads: Livelihoods practices and policies*, London: Overseas Development Institute.

Burgess, M., 2011. Dryland cropping initiative reaps poor harvests. *www.farmersweekly.co.za*. Available at: http://www.farmersweekly.co.za/article.aspx?id=6527&h=Dryland-cropping-initiative-reaps-poor-harvests [Accessed June 12, 2012].

Burtenshaw, J., 2006. Can South Africa address the skills shortage crisis? Available at: http://www.sagoodnews.co.za/newsletter_archive/can_south_africa_address_the_skills_shortage_crisis__2.html [Accessed March 11, 2013].

Büscher, B., 2009. Connecting political economies of energy in South Africa. *Energy Policy*, 37(10), pp.3951–3958.

Butler, A., 2010. Consolidation first: Institutional reform priorities in the creation of a developmental state in South Africa. In O. Edigheji, ed. *Constructing a*

democratic developmental state in South Africa : Potentials and challenges. Cape Town South Africa: HSRC Press, pp. 183–201.

Butler, A., 2009a. *Contemporary South Africa* 2nd ed., Houndmills, Basingstoke, Hampshire ; New York, NY: Palgrave Macmillan.

Butler, A., 2009b. Redrawing Organisational diagrams is the easy part. *Business Day*. Available at: https://mail.google.com/mail/?shva=1#search/capacity+scott/119fd2996681bd3f [Accessed May 28, 2010].

Butler, A., 2008. Talk of state's "lack of capacity" ignores very capable cheats. *Business Day*. Available at: https://mail.google.com/mail/?shva=1#search/capacity+scott/120344b19c88ad5d [Accessed May 28, 2010].

Butler, G., 1981. *Karoo morning : an autobiography (1918-35)*, Cape Town: D. Philip.

Cabral, L. & Scoones, I., 2006. Narratives of Agricultural Policy in Africa: What Role for Ministries of Agriculture? In Future Agricultures. Institute for Development Studies Sussex.

Cadenas, A. & Cabezudo, S., 1998. Biofuels as Sustainable technologies: Perspectives for Less Developed Countries. *Technological forecasting and Social Change*, 58, pp.83–103.

Calland, R., 2006. *Anatomy of South Africa: who holds the power?*, Cape Town: Zebra Press.

Cameron, R., 2010. Redefining political-administrative relationships in South Africa. *International Review of Administrative Sciences*, 76(4), pp.676–701.

Capa, Z., 2012. MEC Zoleka Capa: Eastern Cape Rural Development and Agrarian Reform Prov Budget Vote 2012/13 (English). *South African Government Information*. Available at: http://www.info.gov.za/speech/DynamicAction?pageid=461&sid=26083&tid=61627 [Accessed November 11, 2012].

Carolan, M.S., 2010. Ethanol's most recent breakthrough in the United States: A case of socio-technical transition. *Technology in Society*, 32(2), pp.65–71.

Carrim, Y., 2010. Towards better understanding of the service delivery protests. *Cooperative Governance and Traditional Affairs*. Available at: http://www.dplg.gov.za/index.php/news/174-yunus-carrim/132-towards-better-understanding-of-the-service-delivery-protests.html [Accessed July 28, 2011].

Carter, M.R. & May, J., 1999. One Kind of Freedom: Poverty Dynamics in Post-Apartheid South Africa.

Cash, D. *et al.*, 2006. Scale and Cross-Scale Dynamics: Governance and Information in a Multilevel World. *Ecology and Society*, 11(2), p.8.

Cassim, R. & Jackson, W., 2003. *Sustainable Development: The Case of Energy in South Africa*, Winnipeg: International Institute for Sustainable Development.

Castilla, E.J., 2008. Gender, Race, and Meritocracy in Organizational Careers. *American Journal of Sociology*, 113(6), pp.1479–1526.

Castree, N., 2006. From neoliberalism to neoliberalisation: consolations, confusions, and necessary illusions. *Environment and Planning A*, 38(1), pp.1–6.

CEF, 2008a. Make your fire like the old lady - "Basa njengo Magogo." *Central Energy Fund*. Available at: http://www.cef.org.za/index.php?view=article&id=64%3Amake-your-fire-like-the-old-lady-qbasa-njengo-magogoq&option=com_content&Itemid=24 [Accessed October 10, 2010].

CEF, 2008b. Rollout of the Basa njengo Magogo programme. *Central Energy Fund*. Available at: http://cef.org.za.www29b.your-server.co.za/index.php?view=article&id=40%3Arollout-of-the-basa-njengo-magogo-programme&option=com_content&Itemid=17 [Accessed October 10, 2010].

Chalmers, J. & Archer, G., 2011. Development of a sustainability reporting scheme for biofuels: A UK case study. *Energy Policy*, 39(10), pp.5682–5689.

Chambers, D., 2006. *Biofuels in South Africa: Factors Influencing Production and Consumption*. Masters of Business Administration. University of Pretoria.

Charles, M.B. *et al.*, 2007. Public policy and biofuels: The way forward? *Energy Policy*, 35(11), pp.5737–5746.

Cheru, F., 1992. *The Not So Brave New World! Problems and Prospects of Regional Integration in Post-Apartheid Southern Africa*, The South African Institute of International Affairs.

Chetty, T., 2007. *Factors Influencing the Success of Ethanol Production For Use In Liquid Transport Fuels In South Africa*. Masters of Business Administration. Pretoria: University of Pretoria.

Chipkin, I., 2008. Race, redress and the rise of managerialism in the public service. *Spark*, Oct(16).

Clancy, J., 2008. Are biofuels pro-poor? Assessing the evidence. *The European Journal of Development Research*, 20(3), pp.416–431.

Clay, E. & Schaffer, B. eds., 1984. *Room for manoeuvre: An exploration of public policy planning in Agricultural and Rural Development*, Cranbury: Associated University Presses.

Clements, R., 2008. *Scoping study into the impacts of bioenergy development on food security*, Rugby: Practical Action.

Cockerill, S. & Hongo, H., 2005. Farming for Energy for Better Livelihoods in Southern Africa – FELISA. In PfA-TaTEDO Policy Dialogue Conference on the Role of Renewable Energy for Poverty Alleviation and Sustainable Development in Africa. Dar-es-Salaam.

Colebatch, H., 2009a. Governance as a conceptual development in the analysis of policy. *Critical Policy Studies*, 3(1), pp.58–67.

Colebatch, H., 2000. Government and governmentality: using multiple approaches to the analysis of government. In Australasian Political Studies Association 2000 Annual Conference. Australian National University.

Colebatch, H., 2009b. *Policy*, Maidenhead: Open University Press.

Colebatch, H. & Gill, Z., 2006. "Busy little workers": policy workers' own accounts'. In H. Colebatch, ed. *Beyond the Policy Cycle: the policy process in Australia*. Allen and Unwin, pp. 240–65.

Van Coller, A., 2006. South African Biofuels Strategy Development.

Commission of the European Communities, 2006. *An EU Strategy for Biofuels*, Brussels: Commission of the European Communities.

COMPETE, 2009. Conference Summary and Policy Recommendations. In Bioenergy for Sustainable Development in Africa – Lessons learnt from COMPETE'. Brussels: COMPETE. Available at: http://www.compete-bioafrica.net/events/events2/Brussels/COMPETE-Conference-Summary-Brussels-Nov2009-091215-final.pdf [Accessed August 18, 2010].

Competition Commission, 2006. *In The Competition Tribunal of South Africa: Case No: 101/LM/Dec04*, Johannesburg: Competition Commission.

Conway, G., 1998. *The doubly green revolution : food for all in the twenty-first century*, Ithaca N.Y.: Comstock Pub. Associates.

Cooper, T. & McAlinden, L., 2012. *Bioenergy Policy Principles: Workshop Report*, University of Oxford: UK Energy Research Centre.

Corder, C., 1997. The Reconstruction and Development Programme: Success or Failure? *Social Indicators Research*, 41(1/3), pp.183–203.

COSATU, 2009. About the Tripartite Alliance. *COSATU*. Available at: http://www.cosatu.org.za/show.php?ID=2051 [Accessed June 8, 2013].

COSATU, 2007. COSATU Submission on the Draft Biofuels Industrial Strategy of South Africa.

Cotula, L., 2012. The international political economy of the global land rush: A critical appraisal of trends, scale, geography and drivers. *Journal of Peasant Studies*, 39(3-4), pp.649–680.

Cotula, L., Dyer, N. & Vermeulen, S., 2008. *Fuelling exclusion? The biofuels boom and poor people's access to land*, London: International Institute for Environment and Development.

Court, J. & Young, J., 2003. *Bridging Research and Policy: Insights from 50 case studies*, London: Overseas Development Institute. Available at: http://www.odi.org.uk/resources/download/148.pdf [Accessed January 18, 2010].

Cousins, B. & Hall, R., 2013. Farming problems are clear but the solutions are not. *Mail and Guardian*. Available at: http://mg.co.za/article/2013-06-14-00-farming-problems-are-clear-but-the-solutions-are-not/ [Accessed August 7, 2013].

Creamer, T., 2012. Fuel for thought. *Engineering News*. Available at: http://www.engineeringnews.co.za/article/fuel-for-thought-2012-04-20 [Accessed June 13, 2012].

Creamer, T., 2013. PetroSA, Sinopec to move ahead with Project Mthombo study. *Engineering News*. Available at: http://www.engineeringnews.co.za/article/petrosa-sinopec-to-move-ahead-with-project-mthombo-study-2013-03-26 [Accessed April 7, 2013].

Crush, J. ed., 1995. *Power of development*, London ; New York: Routledge.

Cushion, E., Whiteman, A. & Dieterle, G., 2010. *Bioenergy Development: Issues and Impacts for Poverty and Natural Resource Management*, Washington D.C.: The World Bank.

DAFF, 2010. *Estimate of the Contribution of the Agriculture Sector to Employment in the South African Economy*, Pretoria: Economic Services, Department of Agriculture, Forestry and Fisheries.

Dahl, R., 1978. Pluralism Revisited. *Comparative Politics*, 10(2), pp.191–203.

Dalton, M., 1959. *Men who manage : fusions of feeling and theory in administration*, London: John Wiley and Sons.

Daschle, T., 2007. Food for fuel? *Foreign Affairs*, 86(5), pp.157–162.

Dauvergne, P. & Neville, K., 2010. Forests, food, and fuel in the tropics: the uneven social and ecological consequences of the emerging political economy of biofuels. *Journal of Peasant Studies*, 37(4), pp.631–660.

Davidson, O., 2006a. Energy for sustainable development: An introduction. In H. Winkler, ed. *Energy policies for sustainable development in South Africa*. Cape Town: Energy Research Centre, University of Cape Town.

Davidson, O., 2006b. Energy Policy. In H. Winkler, ed. *Energy policies for sustainable development in South Africa*. Cape Town: Energy Research Centre, University of Cape Town, pp. 4–22.

Davison, S.C., Ochieng, F.X. & wa Gathui, T., 2010. *Liquid Biofuels Strategies and Policies in selected African Countries*, Rugby: Practical Action Consulting.

De Bruyn, C., 2009. Biofuels policy framework acts as disincentive, not incentive – Makenete. *Research Channel Africa*. Available at: http://www.researchchannel.co.za/print-version/biofuels-policy-framework-acts-as-disincentive-not-incentive-makenete-2009-03-30 [Accessed April 7, 2013].

Delshad, A.B., 2012. Revisiting "Who Influences Whom?" Agenda Setting on Biofuels. *Congress & the Presidency*, 39(2), pp.177–198.

Demirbas, A., 2006. Progress and recent trends in biofuels. *Progress in Energy and Combustion Science*, 33(2007), pp.1–18.

Demirbas, A.H. & Demirbas, I., 2007. Importance of rural bioenergy for developing countries. *Energy Conversion and Management*, 48, pp.2386–2398.

Department of Agriculture, 2003. *Food Price Monitoring Committee Final Report*, Pretoria: Department of Agriculture. Available at: http://www.nda.agric.za/docs/GenReports/FPMC/default.htm.

Department of Agriculture, Forestry and Fisheries, 2010. Canola Production Guideline.

Department of Energy, 2011a. *Discussion Document on the Review of Fuel Specification and Standards for South Africa*, Pretoria: Department of Energy.

Department of Energy, 2011b. Draft Regulations Regarding the Mandatory Blending of Biofuels with Petrol and Diesel. *Government Gazette*, 555(9589).

Department of Energy, 2012. IPP Renewables. *Renewable Energy Independent Power Producer Procurement Programme*. Available at: http://www.ipprenewables.co.za/ [Accessed March 8, 2014].

Department of Minerals and Energy, 2007. Biofuels Industrial Strategy of the Republic of South Africa.

Department of Minerals and Energy, 2006. Draft Biofuels Industrial Strategy of the Republic of South Africa.

Department of Trade and Industry, 2010. *Industrial Policy Action Plan 2010/11-2012/13*, Pretoria: Department of Trade and Industry.

Department of Water Affairs, 2012. Orange-Fish. *Orange-Fish Transfer*. Available at: http://www.dwaf.gov.za/orange/Mid_Orange/orange-f.htm [Accessed November 1, 2012].

Van Der Walt, G., 2013. Governance Apparatus in South Africa: From Policy Design to Service Delivery. In S. Vyas-Doorgapersad, L.-M. Tshombe, & E. P. Ababio, eds. *Public administration in Africa: performance and challenges*. Public administration and public policy. CRC Press.

Diaz-Chavez, R. *et al.*, 2010. *Mapping Food and Bioenergy in Africa*, Ghana: Forum for Agricultural Research in Africa.

Dipuo-Peters, E., 2012. Cradock biofuels project to be case study for sector. Available at: http://www.getnews.co.za/story?id=2015 [Accessed March 5, 2013].

Dirlik, A., 2012. Developmentalism. *Interventions*, 0(0), pp.1–19.

DME, 2007. *Department of Minerals and Energy Annual Report 2006-2007*, Pretoria: Department of Minerals and Energy. Available at: http://www.info.gov.za/view/DownloadFileAction?id=72590 [Accessed April 20, 2013].

DME, 1998. *White Paper on the Energy Policy of the Republic of South Africa*, Pretoria: Government Printers.

DoE, 2009. *Digest of South African Energy Statistics*, Pretoria: Department of Energy.

DoE, 2013. *Draft Strategic Stocks Petroleum Policy and Draft Strategic Stocks Implementation Plan*,

Dolowitz, D. & Marsh, D., 14:26:20. Who Learns What from Whom: a Review of the Policy Transfer Literature. *Political Studies*, 44(2), pp.343–357.

Donnely, L., 2012. Eskom grilled on power price. *Mail and Guardian*. Available at: http://mg.co.za/article/2012-08-24-00-eskom-grilled-on-power-price [Accessed August 13, 2013].

Dorman, S., 2012. *Democracy in comparative perspective*, Andover: Cengage Learning.

DPLG, 2008. *15 Year Review Report on the State of Intergovernmental Relations in South Africa*, Pretoria: The Department of Provincial and Local Government.

Drimie, S. & Ruysenaar, S., 2010. The Integrated Food Security Strategy of South Africa: An Institutional Analysis. *Agrekon*, 49(3), pp.316–337.

Dryzek, J.S., 2002. A Post-Positivist Policy-Analytic Travelogue. *The Good Society*, 11(1), pp.32–36.

Du Toit, A., 2005. *Poverty Measurement Blues: some reflections on the space for understanding "chronic" and "structural" poverty in South Africa*, PLAAS.

Du Toit, A., 2012. *Making Sense of "Evidence": Notes on the Discursive Politics of Research and Pro-Poor Policy Making*, Bellville: PLAAS.

Du Toit, A. & Neves, D., 2007. *In search of South Africa's Second Economy: Chronic poverty, economic marginalisation and adverse incorporation in Mt Frere and Khayelitsha*, Bellville: Programme for Land and Agrarian Studies.

Du Toit, A. & Ziervogel, G., 2004. Vulnerability and Food Insecurity Background concepts for informing the development of a national FIVIMS for South Africa.

Dutt, S., 2003. Keel - The Next Generation Meta Framework. *The Silver Side*. Available at: http://www.theserverside.com/news/1364592/Keel-The-Next-Generation-Meta-Framework [Accessed February 26, 2013].

Dye, T.R., 1998. *Understanding public policy*, Upper Saddle River, N.J.: Prentice Hall.

Dyer, L., 2006. *Critical thinking for business students*, Concord, ON: Captus Press.

Eakin, H. & Lemos, M., 2006. Adaptation and the state: Latin America and the challenge of capacity-building under globalization. *Global Environmental Change*, 16(1), pp.7–18.

Eastern Cape Office of the Premier, 2008. *Assessment of the Eastern Cape Provincial Growth and Development Plan Final Report: March 2009*, Bisho: Eastern Cape Office of the Premier.

Eberhard, A., 2004. The Political Economy of Power Sector Reform in South Africa. In Political Economy of Power Market Reform conference 2003. Stanford University.

ECDC, 2012. Eastern Cape Development Corporation; bio-fuels. *Eastern Cape Development Corporation*. Available at: http://www.ecdc.co.za/biofuels [Accessed April 4, 2012].

Edigheji, O., 2005. *A Democratic Developmental State in Africa? A concept paper. Research report 105 Retrieved 21 July, 2009, from*, Johannesburg: Centre for Policy Studies.

Edigheji, O., 2010a. *Constructing a democratic developmental state in South Africa : Potentials and challenges*, Cape Town South Africa: HSRC Press.

Edigheji, O., 2010b. Introduction. In *Constructing a democratic developmental state in South Africa : Potentials and challenges*. Cape Town South Africa: HSRC Press, pp. 1–31.

Education and Training Unit, 2007. The Policy and law making process. *Community organisers Toolbox*. Available at: http://www.etu.org.za/toolbox/docs/govern/policy.html [Accessed March 13, 2013].

Eicher, C., Maredia, K. & Sitholeniang, I., 2006. Crop biotechnology and the African farmer. *Food Policy*, 31(6), pp.504–527.

Eide, A., 2008. *Right to food and the impact of biofuels (Agrofuels)*, Rome: Food and Agriculture Organization. Available at: http://www.fao.org/righttofood/publi08/Right_to_Food_and_Biofuels.pdf [Accessed January 19, 2010].

Eikeland, P., 2006. *Biofuels – the new oil for petroleum industry?*, Lysaker: Fridjof Nansen Institute.

Elphinstone, E., 2011. John Ingram, Polly Ericksen and Diana Liverman (eds): Food Security And Global Environmental Change. *Food Security*, 3(3), pp.401–404.

Ericksen, P., 2008. Conceptualizing food systems for global environmental change research. *Global Environmental Change*, 18, pp.234–245.

Ericksen, P.J., Ingram, J.S.I. & Liverman, D.M., 2009. Food security and global environmental change: emerging challenges. *Environmental Science & Policy*, 12(4), pp.373–377.

Escobar, A., 2012. *Encountering development: the making and unmaking of the third world*, Princeton, N.J: Princeton University Press.

Esterhuizen, D., 2009. *South Africa Biofuels Annual*, Pretoria: Global Agricultural Information Network.

Etzioni, A., 1967. Mixed-Scanning: A "Third" Approach to Decision-Making. *Public Administration Review*, 27(5), pp.385–392.

Evans, P.B., 2010. Constructing a 21st Century Developmental State: Potentials and Pitfalls. In O. Edigheji, ed. *Constructing a democratic developmental state in South Africa : Potentials and challenges*. Cape Town South Africa: HSRC Press, pp. 37–58.

Evans, P.B., Rueschemeyer, D. & Skocpol, T. eds., 1985. *Bringing the state back in*, Cambridge [Cambridgeshire] ; New York: Cambridge University Press.

Ewing, M. & Msangi, S., 2009. Biofuels production in developing countries: assessing tradeoffs in welfare and food security. *Environmental Science & Policy*, 12(4), pp.520–528.

FAO, 2008. Soaring Food Prices: Facts, Perspectives, Impacts and Actions Required. In High-level conference on on world food security: The challenges of Climate Change and Bioenergy. Rome: FAO.

Ferguson, J., 1990. *The Anti-politics machine: "Development," depoliticization and Bureacratic Power in Lesotho*, Cambridge: Cambridge University Press.

Fernández Durán, R. & Ashe, E., 2012. *The breakdown of global capitalism, 2000-2030: multidimensional crisis, systemic chaos, ecological ruin and a war for resources : preparing for the beginning of the collapse of industrial civilisation : the beginning of the end of fossil fuel, a total historical rupture*, Madrid: Libros en Acción.

Fine, B., 2008. Engaging the MEC: Or a Lot of My Views on a Lot of Things. In Paper for Workshop at University of KwaZulu-Natal.

Fine, B., 2010. Can South Africa be a Developmental State? In O. Edigheji, ed. *Constructing a democratic developmental state in South Africa : Potentials and challenges*. Cape Town South Africa: HSRC Press, pp. 169–182.

Fine, B. & Rustomjee, Z., 1996. *The political economy of South Africa : from minerals-energy complex to industrialisation*, Boulder CO: Westview Press.

Fischer, F., 2007. Deliberative Policy Analysis as Practical Reason: Integrating Empirical and Normative Arguments. In F. Fischer, G. Miller, & M. S. Sidney, eds. *Handbook of public policy analysis : theory, politics, and methods*. Boca Raton: CRC/Taylor & Francis, pp. 223–236.

Fischer, F., 2003. *Reframing public policy : discursive politics and deliberative practices*, Oxford; New York: Oxford University Press.

Fischer, F., 1990. *Technocracy and the politics of expertise*, New Park (Calif.); London; New Delhi: Sage Publ.

Fluri, T.P., 2009. The potential of concentrating solar power in South Africa. *Energy Policy*, 37(12), pp.5075–5080.

Food Security Working Group, 1997. Food security policy for South Africa: a discussion document.

Ford, L.H., 2003. Challenging Global Environmental Governance: Social Movement Agency and Global Civil Society. *Global Environmental Politics*, 3(2), pp.120–134.

Fortin, E., 2011. Multi-stakeholder initiatives to regulate biofuels: the Roundtable for Sustainable Biofuels. Available at:

http://www.iss.nl/fileadmin/ASSETS/iss/Documents/Conference_papers/LDPI/30_Elizabeth_Fortin.pdf [Accessed June 18, 2012].

Foucault, M., 1980. *Power/knowledge: selected interviews and other writings, 1972-1977* 1st American ed., New York: Pantheon Books.

Franco, J. *et al.*, 2010. Assumptions in the European Union biofuels policy: frictions with experiences in Germany, Brazil and Mozambique. *Journal of Peasant Studies*, 37(4), pp.661–698.

Fraser-Moloketi, G., 2006. *Public Service Reform in South Africa: An overview of selected case studies from 1994-2004*. Magister Administrationis (M.Admin). Pretoria: University of Pretoria.

Freund, B. ed., 2010. Development Dilemmas in Post-Apartheid South Africa: An introduction. In *Development dilemmas in post-apartheid South Africa*. Scottsville, South Africa: University of Kwazulu-Natal Press.

Funke, N., Shaxson, L. & Bielak, A., 2009. *Evidence-based policy for Environmental Sustainability: A path forward for South Africa*, Pretoria: Council fo Scientific and Industrial Research.

Funke, T., 2010. *Biofuel production in South Africa: the games, the cost of production and policy options*. Dcom (Agricultural Economics). Pretoria: University of Pretoria.

Funke, T. & Klein, P., 2011. Analyzing government decision making in the South African biofuels industry: a game theoretic approach. *Biofuels*, 2, pp.345–354.

Funke, T., Strauss, P. & Meyer, F., 2009. Modelling the impacts of the industrial biofuels strategy on the South African agricultural and biofuel subsectors. *Agrekon*, 48(3), pp.223–244.

Furness, J., 2004. Sugar beet farming study under way in E Cape. *Engineering News*. Available at: http://www.engineeringnews.co.za/article/sugar-beet-farming-study-under-way-in-e-cape-2004-09-16 [Accessed October 13, 2012].

Future Agricultures, 2011. *Land Grabbing in Africa and the New Politics of Food*, London: Future Agricultures. Available at: www.future-agricultures.org.

Gallagher, E., 2008. *The Gallagher Review of the indirect effects of biofuels production*, London: Renewable Fuels Agency, UK Government.

Gaventa, J., 2006. Finding the Spaces for Change: A power analysis. *IDS Bulletin*, 37(6), pp.23–33.

Gaventa, J., 2003. *Power after Lukes: a review of the literature*, Brighton: Institute of Development Studies.

Geels, F.W., 2004. From sectoral systems of innovation to socio-technical systems. *Research Policy*, 33(6-7), pp.897–920.

Geels, F.W., 2011. The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental Innovation and Societal Transitions*, 1(1), pp.24–40.

George, A. & Bennet, A., 2005. *Case studies and theory development in the social sciences*, Cambridge Mass. ;;London: MIT Press.

Georgescu-Roegen, N., 1971. *The Entropy Law and the Economic Process*, Cambridge Mass.: Harvard University Press.

German, L., Schoneveld, G.C. & Pacheco, P., 2011. The Social and Environmental Impacts of Biofuel Feedstock Cultivation: Evidence from Multi-Site Research in the Forest Frontier. *Ecology and Society*, 16(3). Available at: http://www.ecologyandsociety.org/vol16/iss3/art24/ [Accessed June 21, 2012].

Giddens, A., 1984. *The constitution of society: introduction of the theory of structuration*, Berkeley: University of California Press.

Giliomee, H., Myburgh, J. & Schlemmer, L., 2001. Dominant Party Rule, Opposition Parties and Minorities in South Africa. *Democratization*, 8(1), pp.161–182.

Gillon, S., 2010. Fields of dreams: negotiating an ethanol agenda in the Midwest United States. *Journal of Peasant Studies*, 37(4), pp.723–748.

Godin, B., 2009. *The Making of Science, Technology and Innovation: Conceptual Frameworks as Narratives 1945-2005*, Montreal: Centre Urbanisation Culture Société Institut national de la recherche scientifique. Available at: http://www.csiic.ca/PDF/TheMakingOfScience.pdf [Accessed June 21, 2010].

Goldblatt, A., 2010. *Agriculture: Facts and Trends. South Africa*, Cape Town: World Wildlife Fund South Africa.

Government of National Unity, 1994. Reconstruction and Development Plan White Paper: Discussion Document.

Greenberg, S., 2003. Political stabilisation and market extension: Restructuring of agriculture and its impact on food security. *Interfund Development Update 4(2)*.

Greenberg, S., 2010. *Status report on land and agricultural policy in South Africa, 2010*, Bellville: Institute for Poverty, Land and Agrarian Studies.

Grimble, R. & Chan, M., 1995. Stakeholder analysis for natural resource management in developing countries. *Natural Resources Forum*, 19(2), pp.113–124.

Grindle, M.S. & Thomas, J.W., 1991. *Public choices and policy change: the political economy of reform in developing countries*, Johns Hopkins University Press.

Grundmann, R., 1996. *Mending the ozone layer: The role of transnational policy networks*, MPIfG Discussion Paper, Max-Planck-Institut für Gesellschaftsforschung. Available at: http://www.econstor.eu/handle/10419/43744 [Accessed May 20, 2013].

Gumede, W.M., 2012. *Restless nation: making sense of troubled times*, Cape Town: Tafelberg.

Gumede, W.M., 2007. *Thabo Mbeki and the battle for the soul of the ANC*, London; New York: Zed Books.

Haas, P.M., 1989. Do regimes matter - epistemic communities and Mediterranean pollution-control. *Political Science Department Faculty Publication Series*, 43(3). Available at: http://scholarworks.umass.edu/polsci_faculty_pubs/51.

Haas, P.M., 1992. Introduction: Epistemic Communities and International Policy Coordination. *International Organization*, 46(1), pp.1–35.

Habermas, J., 1981. *Theory of communicative action*, Boston, Mass: Beacon Press.

Habermas, J., 1989. *Theory of communicative action.*, Boston: Beacon Press.

Hagendijk, R. & Irwin, A., 2006. Public Deliberation and Governance: Engaging with Science and Technology in Contemporary Europe. *Minerva*, 44(2), pp.167–184.

Hajdu, F., 2006. *Local worlds : rural livelihood strategies in eastern Cape, South Africa*, Linköping :: Department of Water and Environmental Studies, Linköping University,.

Hajer, M., 1995. Discourse Analysis. In *Politics of the Environmental Discourse: Ecological Modernisation and the Policy Process*. Oxford: Oxford University Press, pp. 42–72.

Hall, G. & Görgens, A., 1978. *Studies of Mineralization in South African Rivers*, Pretoria: Council for Scientific and Industrial Research.

Hall, P. & Taylor, R., 1996. Political Science and the three new institutionalisms. *Political Studies*, XLIV, pp.936–957.

Hansen, U.E. & Nygaard, I., 2013. Sustainable energy transitions in emerging economies: The formation of a palm oil biomass waste-to-energy niche in Malaysia 1990–2011. *Energy Policy*. Available at: http://www.sciencedirect.com/science/article/pii/S030142151301135X [Accessed December 3, 2013].

Hart, D.M. & Victor, D.G., 1993. Scientific elites and the making of US policy for climate change research, 1957-74. *Social Studies of Science*, 23(4), pp.643–680.

Haywood, L. *et al.*, 2009. *Biofuel Production in South Africa, Mozambique, Malawi and Zambia*, Pretoria: Council for Scientific and Industrial Research.

Head, B.W., 2008. Three Lenses of Evidence-Based Policy. *Australian Journal of Public Administration*, 67(1), pp.1–11.

Heclo, H., 1978. Issue Networks and the Executive Establishment. In A. King, ed. *The new American Political System*. Washington D.C.: American Enterprise Institute, pp. 87–107, 115–124.

Hender, P. *et al.*, 2007. *Current Global Challenges and Alternative Futures for South Africa*, Cape Town: The Association for the Study of Peak Oil South Africa.

Hendrickse, M., 2007. Farmer's Weekly | Biofuels sweetener for sugar beet pioneers. *Farmers Weekly*. Available at: http://www.farmersweekly.co.za/article.aspx?id=1084&h=Biofuels-sweetener-for-sugar-beet-pioneers [Accessed October 10, 2012].

Hentz, J., 2000. "QWERTY Worlds" and South Africa's Preference Formation: Ideas and Policy-Making in Transitional South Africa. In S. Page, ed. *Regions and development: politics, security and economics*. EADI book series. London ; Portland, OR: Frank Cass, pp. 139–162.

Hentz, J., 2005. *South Africa and the logic of regional cooperation*, Bloomington: Indiana University Press. Available at: http://site.ebrary.com/id/10132016 [Accessed March 12, 2013].

Hertel, T.W., Tyner, W.E. & Birur, D.K., 2008. Biofuels for all? Understanding the Global Impacts of Multinational Mandates. In American Agricultural Economics Association Annual Meeting. Orlando.

Hettne, B., 2009. *Thinking about development*, London: Zed.

Hiemstra-van der Horst, G. & Hovorka, A.J., 2008. Reassessing the "energy ladder": Household energy use in Maun, Botswana. *Energy Policy*, 36(9), pp.3333–3344.

Hill, L., 2005. Sugar-beet study on track for July completion. *Engineering News*. Available at: http://www.engineeringnews.co.za/print-version/sugarbeet-study-on-track-for-july-completion-2005-05-27 [Accessed November 2, 2012].

Hill, M., 2005. *The public policy process*, New York: Pearson Longman.

Hira, A. & de Oliveira, L.G., 2009. No substitute for oil? How Brazil developed its ethanol industry. *Energy Policy*, 37(6), pp.2450–2456.

Hirschheim, R., 1985. Information systems epistemology. An historical perspective. In E. Mumford *et al.*, eds. *Research Methods in Information Systems*. Holland: North, pp. 13–38.

Hlongwane, S., 2013. Daily Maverick - Hey Eskom, remember 2008? *Daily Maverick*. Available at: http://www.dailymaverick.co.za/article/2012-01-12-hey-eskom-remember-2008 [Accessed February 27, 2013].

Hobson, F., 2006. Draft Eastern Cape Bio-fuel Strategy.

Hodge, J., 2000. *An Overview of the role of Producer Services in the Petrochemicals Industry in South Africa : A Case Study of Sasol*, Cape Town: Development Policy Research Unit, University of Cape Town.

Hodgson, S.M. & Irving, Z., 2007a. Policy and its exploration. In S. Hodgson & Z. Irving, eds. *Policy reconsidered : meanings, politics and practices*. Bristol, U.K.: Policy Press.

Hodgson, S.M. & Irving, Z., 2007b. Studying policy: a way forward. In S. Hodgson & Z. Irving, eds. *Policy reconsidered : meanings, politics and practices*. Bristol, U.K.: Policy Press, pp. 191–207.

Hofstätter, S., 2007. Farmer's Weekly | Qamata: how deep is the rot? *Farmers Weekly*. Available at: http://www.farmersweekly.co.za/article.aspx?id=1115&h=Qamata:-how-deep-is-the-rot [Accessed November 2, 2012].

Hogwood, B.W. & Gunn, L.A., 1984. *Policy analysis for the real world*, Oxford [Oxfordshire]; New York: Oxford University Press.

Hollander, G., 2010. Power is sweet: sugarcane in the global ethanol assemblage. *Journal of Peasant Studies*, 37(4), pp.699–721.

Holm, D. & Agert, C., 2002. Job Creation Potential of Renewable Energies in South Africa. *ESI Africa*, (3).

Howells, M.I. *et al.*, 2010. Calabashes for kilowatt-hours: Rural energy and market failure. *Energy Policy*, 38(6), pp.2729–2738.

Hughes, J.A., 1990. *The philosophy of social research* 2nd ed., London ; New York: Longman.

Ingram, J., 2011. A food systems approach to researching food security and its interactions with global environmental change. *Food Security*. Available at: http://www.springerlink.com/index/10.1007/s12571-011-0149-9 [Accessed December 5, 2011].

International Assessment of Agricultural Knowledge, Science and Technology for Development, 2009. *Agriculture at a Crossroads: Executive Summary of the Synthesis Report*, Washington D.C.: IAASTD.

International Energy Agency, 2013. Biofuels. *International Energy Agency*. Available at: http://www.iea.org/topics/biofuels/ [Accessed August 17, 2013].

International Energy Agency, 2007. *Renewables in Global Energy Supply: An IEA Fact Sheets*, Paris.

International Energy Agency, 2008. *World Energy Outlook*, Paris: International Energy Agency. Available at: http://www.iea.org.

Jacobs, P., 2009. Agricultural market reforms and the rural poor in South Africa. In PLAAS Poverty Workshop 2009.

Jacobson, K., 2013. *From Betterment to Bt Maize*. Doctoral Thesis. Uppsala: Swedish University of Agricultural Sciences.

James, H., 1956. Agriculture in the National Economy. *Increasing Understanding of Public Problems and Policies*.

Jann, W. & Wegrich, K., 2007. Theories of the policy cycle. In F. Fischer, G. Miller, & M. S. Sidney, eds. *Handbook of public policy analysis : theory, politics, and methods*. Boca Raton: CRC/Taylor & Francis, pp. 43–63.

Jansen, K. & Roquas, E., 2005. Absentee expertise: science advice for biotechnology regulation in developing countries. In M. Leach, I. Scoones, & B. Wynne, eds. *Science and citizens : globalization and the challenge of engagement*. London; New York: Zed Books.

Jasanoff, S., 2003a. (No?) Accounting for expertise. *Science and Public Policy*, 30, pp.157–162.

Jasanoff, S., 2003b. Technologies of Humility: Citizen Participation in Governing Science. *Minerva*, 41(3), pp.223–244.

Jasanoff, S. & Kim, S.-H., 2009. Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea. *Minerva*, 47(2), pp.119–146.

Jenkins, R., 2007. Meanings. In S. Hodgson & Z. Irving, eds. *Policy reconsidered : meanings, politics and practices*. Bristol, U.K.: Policy Press, pp. 21–36.

Jenkins-Smith, H.C., Clair, G.K.S. & Woods, B., 1991. Explaining Change in Policy Subsystems: Analysis of Coalition Stability and Defection over Time. *American Journal of Political Science*, 35(4), pp.851–880.

Jessop, B., 2001. Bringing the State Back In (Yet Again): Reviews, Revisions, Rejections, and Redirections. *International Review of Sociology*, 11(2), pp.149–173.

Jewitt, G. *et al.*, 2009. *Scoping Study on Water Use of Crops/Trees for Biofuels in South Africa*, Pretoria: Water Research Commission.

JIPSA, 2010. *Growing priority skills in South Africa Final report on JIPSA*, Pretoria: The Presidency.

JIPSA, 2007. *Joint Initiative on Priority Skills Acquisition Report*, Pretoria: The Presidency.

John, P., 2012. *Analysing public policy*, London: Routledge.

John, P., 2003. Is There Life After Policy Streams, Advocacy Coalitions, and Punctuations: Using Evolutionary Theory to Explain Policy Change? *Policy Studies Journal*, 31(4), pp.481–498.

Johnson, C., 1982. *Miti and the Japanese Miracle: The Growth of Industrial Policy : 1925-1975*, Stanford University Press.

Johnson, R.W., 2010. *South Africa's brave new world : the beloved country since the end of apartheid*, London: Penguin Books.

Johnston, M. & Holloway, T., 2007. A Global Comparison of National Biodiesel Production Potentials. *Environmental Science & Technology*, 41(23), pp.7967–7973.

Jones, H., 2009. *Policy-making as discourse: a review of recent knowledge-to-policy literature*, Bonn: IKM Emergent Research Programme, European Association of Development Research and Training Institutes (EADI).

Jones, H., 2011. Taking responsibility for complexity. Available at: http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/6811.pdf.

Jones, P. & Thornton, P., 2003. The potential impacts of climate change on maize production in Africa and Latin America in 2055. *Global Environmental Change*, 13, pp.51–59.

Jull, C. *et al.*, 2007. *Recent trends in the law and policy of bioenergy production, promotion and use*, Rome: Food and Agricultural Organisation.

Jumbe, C.B.L., Msiska, F.B.M. & Madjera, M., 2009. Biofuels development in Sub-Saharan Africa: Are the policies conducive? *Energy Policy*, 37(11), pp.4980–4986.

Kartha, S., Leach, G. & Rajan, S.C., 2005. *Advancing Bioenergy for Sustainable Development: Guideline for policymakers and investors vol i, ii & iii*, Stockhol Environment Institute.

Keeley, J., 2003. *Understanding Environmental Policy Processes: Cases from Africa*, London: Earthscan.

Keeley, J. & Scoones, I., 2004. *Global Science, Global Policy: Local to global policy processes for soils management in Africa*, Institute for Development Studies.

Available at: http://www.journals.cambridge.org/abstract_S0022278X03004476 [Accessed January 12, 2012].

Keeley, J. & Scoones, I., 2003. *Understanding environmental policy processes: cases from Africa*, London: Earthscan.

Keeley, J. & Scoones, I., 1999. *Understanding Environmental Policy Processes: A review*, Sussex: Institute for Development Studies.

Kelley, K. *et al.*, 2003. Good practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care*, 15(3), pp.261–266.

Kenny, A., 2006. Energy Demand. In H. Winkler, ed. *Energy policies for sustainable development in South Africa*. Cape Town: Energy Research Centre, University of Cape Town.

Kent, G., 1999. Globalization and food security in Africa. In *Not by bread alone: Food security and governance in Africa*. Johannesburg: Wits University Press/ Toda Institute for Global Peace and Policy Research, pp. 17–35.

Khalil, E.L., 1990. Entropy law and exhaustion of natural resources Is Nicholas Georgescu-Roegen's paradigm defensible? *Ecological Economics*, 2(2), pp.163–178.

Khalil, E.L., 1991. Entropy law and Nicholas Georgescu-Roegen's paradigm: A reply. *Ecological Economics*, 3(2), pp.161–163.

Khoo, B.T., 2010. *No insulation : politics and technocracy's troubled trajectory*, Chiba: Institute of Developing Economies, JETRO.

Khosa, M., 2003. *Towards Effective Delivery: Synthesis report on the project entitled "Closing the gap between policy and implementation in South Africa,"* Johannesburg: Centre for Policy Studies.

Khumalo, L., 2007. Biofuels to power Eastern Cape. *SouthAfrica.info*. Available at: http://www.southafrica.info/business/investing/opportunities/biofuels-080307.htm [Accessed October 19, 2012].

Kingdon, J.W., 1984. *Agendas, alternatives, and public policies*, Little, Brown.

Kings, S., 2012. Biofuel plant backfires on community. *Mail and Guardian*. Available at: http://mg.co.za/article/2012-07-12-biofuel-plant-backfires-on-community [Accessed September 18, 2012].

Kirkpatrick, G., 2008. *Technology and social power*, Basingstoke; New York: Palgrave Macmillan.

Kirsten, J., Van Zyl, J. & Vink, N., 1998. *The Agricultural Democratisation of South Africa.*, Cape Town,: AIPA/Francolin Publishers.

De Klerk, M. *et al.*, 2004. *Food security in South Africa: Key policy issues for the medium term. Integrated Rural and Regional Development.*, Pretoria: Human Sciences Research Council.

Koelble, T.A., 1995. The New Institutionalism in Political Science and Sociology. *Comparative Politics*, 27(2), pp.231–243.

Kojima, M. & Johnson, T., 2005. *Potential of biofuels for Transport in Developing Countries*, Washington D.C.: World Bank Energy Sector Management Assistance Programme (ESMAP).

Koning, N. & Mol, A.P.J., 2009. Wanted: institutions for balancing global food and energy markets. *Food Security*, 1(3), pp.291–303.

Koontz, T., 2003. An Introduction to the Institutional Analysis and Development (IAD) Framework for Forest Management Research. In First Nations and Sustainable Forestry: Institutional Conditions for Success. University of British Columbia Faculty of Forestry, Vancouver, B.C. Available at: http://www.forestry.ubc.ca/fnconditions/_documents/TomKoontzPaper.pdf [Accessed January 18, 2010].

Kraak, A., 2011. Horizontal Coordination, Government Performance and National Planning: The Possibilities and Limits of the South African State. *Politikon*, 38(3), pp.343–365.

Kristensen, H. & Gärling, T., 1997. The Effects of Anchor Points and Reference Points on Negotiation Process and Outcome. *Organizational Behavior and Human Decision Processes*, 71(1), pp.85–94.

Kumar-Biswas, P., Pohit, S. & Kumar, R., 2010. Biodiesel from jatropha: Can India meet the 20% blending target? *Energy Policy*, 38(3), pp.1477–1484.

KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development, 2010. *Technical and Financial Feasibility of on-farm Biodiesel production*, Pietermaritzburg: KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development.

Lahiff, E., 2008. *Land Reform in South Africa: A Status Report 2008*, Bellville: Programme for Land and Agrarian Studies.

Landman, J., 2003. *Breaking the grip of Poverty and Inequality in South Africa 2004-2014: Current trends, issues and future policy options*,

Landsberg, C., 2012. Towards a post-apartheid South African foreign policy review. In C. Landsberg & J.-A. van Wyk, eds. *South african foreign policy review*. Pretoria, South Africa: Africa Institute of South Africa; Institute for Global Dialogue.

Lasswell, H., 1951. The policy orientation. In D. Lerner & H. Lasswell, eds. *The Policy Sciences*. Stanford: Stanford University Press, pp. 3–15.

Latour, B., 1996. *Aramis, or, The love of technology*, Cambridge Mass.: Harvard University Press.

Latour, B., 2005. *Reassembling the social : an introduction to actor-network-theory*, Oxford; New York: Oxford University Press.

Lawrence, R.Z., 2010. How Good Politics Results in Bad Policy: The Case of Biofuel Mandates. Available at: http://dash.harvard.edu/handle/1/4553312 [Accessed June 13, 2012].

Leach, M., Scoones, I. & Wynne, B., 2005. Introduction: Science, Citizenship and Globalization. In *Science and citizens : globalization and the challenge of engagement*. London; New York: Zed Books, pp. 3–14.

Lee, R. *et al.*, 2005. Social Science and Social Policy: From National Dilemmas to Global Opportunities. In Reference Paper for the International Forum on the Social Science – Policy Nexus. Buenos Aires, Argentina, and Montevideo, Uruguay.

Leftwich, A., 1995. Bringing politics back in: Towards a model of the development state. *Journal of Development Studies*, 31(3), p.400.

Lehola, P., 2012. *Census 2011: Census in Brief*, Pretoria: Statistics South Africa.

Le Roux, T., 2001. *A Technology Audit of the Transport Fuels Sector in South Africa*, Pretoria: Department of Arts, Culture, Science and Technology.

Letsoalo, E. & Rogerson, C., 1982. Rural "development" Planning under Apartheid: betterment Planning in Lebowa, South Africa. *Geoforum*, 13(4), pp.301–314.

Lever, R., 2012. US looks ahead after ethanol subsidy expires. *phys.org*. Available at: http://phys.org/news/2012-01-ethanol-subsidy-expires.html [Accessed April 2, 2013].

Levin, N.D., 1988. *The opening of vision: Nihilism and the postmodern situation*, London: Routledge.

Lewis, S. & Naidoo, J., 2007. Technocratic School Governance and South Africa's Quest for Democratic Participation. In H. Daun, ed. *Technocratic School Governance and South Africa's Quest for Democratic Participation*. pp. 133–158.

Liebenberg, F., Pardey, P.G. & Kahn, M., 2011. South African agricultural R&D investments: Sources, structure, and trends, 1910–2007. *Agrekon*, 50(2), pp.1–26.

Lima, M.G.B. & Gupta, J., 2013. The Policy Context of Biofuels: A Case of Non-Governance at the Global Level? *Global Environmental Politics*, pp.48–66.

Lindblom, C.E., 1959. The Science of "Muddling Through." *Public Administration Review*, 19(2), pp.79–88.

Lipsky, M., 2010. *Street-level bureaucracy: Dilemmas of the individual in public services* 2nd ed., New York: Russell Sage Foundation.

Lobell, D.B. *et al.*, 2011. Nonlinear heat effects on African maize as evidenced by historical yield trials. *Nature Climate Change*, 1(1), pp.42–45.

Lobell, D.B. *et al.*, 2008. Prioritizing Climate Change Adaptation Needs for Food Security in 2030. *Science*, 319(5863), pp.607–610.

Lozada, G.A., 1991. A defence of Nicholas Georgescu-Roegen's paradigm. *Ecological Economics*, 3(2), pp.157–160.

Lukes, S., 1974. *Power : a radical view*, London; New York: Macmillan.

Mabee, W.E., 2007. Policy Options to Support Biofuel Production. In L. Olsson, ed. *Biofuels*. Advances in Biochemical Engineering/Biotechnology. Springer Berlin Heidelberg, pp. 329–357. Available at: http://link.springer.com/chapter/10.1007/10_2007_059 [Accessed July 1, 2013].

MacFarlane, D., 2012. Textbooks crisis: Damning report fails Motshekga. *Mail and Guardian*. Available at: http://mg.co.za/article/2012-07-12-damning-report-fails-motshekga [Accessed August 7, 2012].

MacKay, D.J.C., 2009. *Sustainable energy--without the hot air*, Cambridge, England: UIT.

Magdoff, F., 2008. The Political Economy and Ecology of Biofuels. *Monthly Review*, July-August, pp.34–50.

Maia, J. *et al.*, 2011. *Green Jobs: An estimate of the direct employment potential of a greening South African economy*, Johannesburg: Industrial Development Corporation, Development Bank of Southern Africa, Trade and Industrial Policy Strategies.

Mail and Guardian Editorial, 2013. Cronin's spanner in the works. *Mail and Guardian*. Available at: http://mg.co.za/article/2013-02-22-00-editorial-cronins-spanner-in-the-works [Accessed February 22, 2013].

Makanete, A. & Kupka, J., 2007. Encouraging investment in the South African Biofuels Industrry. In SAASVELD Symposium. Nelson Mandela University, Eastern Cape.

Makanete, A., Lemmer, W. & Kupka, J., 2007. *The impact of biofuel production on Food Security: A Briefing Paper with a particular emphasis on maize-to-ethanol production*, Johannesburg: South African Biofuels Association.

Mangoyana, R., 2009. Bioenergy for sustainable development: An African context. *Physics and Chemistry of the Earth, Parts A/B/C*, 34(1-2), pp.59–64.

Manning, N., 2001. The legacy of the New Public management in developing countries. *International Review of Administrative Sciences*, 67, pp.297–312.

Marais, H., 2011. *South Africa pushed to the limit : the political economy of change*, London; New York: Zed.

Marais, H., 2001. *South Africa: Limits To Change: The Political Economy of Transition*, Palgrave Macmillan.

March, J. & Olsen, J., 1984. The New Institutionalism: Organizational Factors in Political Life. *The American Political Science Review*, 78(3), pp.734–749.

Marcus, T., Eales, K. & Wildschut, A., 1996. *Down to Earth*, Durban: Indicator Press.

Marquard, A., 1999. *Making a difference: reflections on the first ten years of the Energy & Development Research Centre at the University of Cape Town*, Cape Town: Energy & Development Research Centre, University of Cape Town.

Marquard, A. & Eberhard, A., 2000. Towards energy equity, efficiency and environmental sustainability in South Africa: policy challenges. *Energy for Sustainable Development*, 4(4), pp.3–7.

Marshall, L., 2008. Biofuels: What the farmers say. *African wildlife*, 62(2).

Martin, M., Mwakaje, A.G. & Eklund, M., 2009. Biofuel development initiatives in Tanzania: development activities, scales of production and conditions for implementation and utilization. *Journal of Cleaner Production*, 17, Supplement 1, pp.S69–S76.

Masera, O.R., Saatkamp, B.D. & Kammen, D.M., 2000. From Linear Fuel Switching to Multiple Cooking Strategies: A Critique and Alternative to the Energy Ladder Model. *World Development*, 28(12), pp.2083–2103.

Masters, L., 2012. Opening the "black box". South African foreign policy making. In C. Landsberg & J.-A. van Wyk, eds. *South African foreign policy review*. Pretoria, South Africa: Africa Institute of South Africa; Institute for Global Dialogue.

Mathews, J.A., 2007. Biofuels: What a Biopact between North and South could achieve. *Energy Policy*, 35(7), pp.3550–3570.

Mathews, J.A., 2008. Opinion: is growing biofuel crops a crime against humanity? *Biofuels, Bioproducts and Biorefining*, 2(2), pp.97–99.

Matinga, M.N. & Annegarn, H.J., 2013. Paradoxical impacts of electricity on life in a rural South African village. *Energy Policy*. Available at: http://www.sciencedirect.com/science/article/pii/S0301421513001705 [Accessed April 15, 2013].

Matinga, M.N., Clancy, J.S. & Annegarn, H.J., 2014. Explaining the non-implementation of health-improving policies related to solid fuels use in South Africa. *Energy Policy*, 68, pp.53–59.

Matondi, P., Havnevik, K. & Beyene, A. eds., 2010. *Biofuels, land grabbing and food security in Africa*, London: Zed.

Matshiqi, A., 2013. Mangaung a bit of a damp squib, but not uninteresting. *Engineering News*. Available at: http://www.engineeringnews.co.za/article/mangaung-a-bit-of-a-damp-squib-but-not-uninteresting-2013-01-18/article_comments:1 [Accessed June 15, 2013].

Maxwell, S., 2001. The Evolution of Thinking about Food Security. In *Food Security in Sub-Saharan Africa*. Scottsville: University of Natal Press.

Maxwell, S. & Ashley, C., 2001. Rethinking Rural Development. *Development Policy Review*, 19(4), pp.395–425.

Maxwell, S. & Slater, R., 2003. Food Policy Old and New. *Development Policy Review*, 21(5-6), pp.531–553.

May, T., 2001. *Social Research: Issues, methods and process* 3rd ed., Buckinham: Open University Press.

Mayet, M., 2008. A green revolution for Africa: A disaster in the making.

McAllister, P., 1992. Rural production, land use and development planning in Transkei: A critique of the Transkei agricultural development study. *Journal of Contemporary African Studies*, 11(2), pp.200–222.

McMichael, P., 2009. A food regime genealogy. *Journal of Peasant Studies*, 36(1), pp.139–169.

McMichael, P., 2010a. Agrofuels in the food regime. *Journal of Peasant Studies*, 37(4), pp.609–629.

McMichael, P., 2010b. CFS comments: Agrofood-feed-fuel complex as context and cause of land grabbing.

McMichael, P., 1997. Rethinking globalization: the agrarian question revisited. *Review of International Political Economy*, 4(4), pp.630–662.

Mesthrie, R. ed., 2002. *Language in South Africa*, Cambridge, U.K. ; New York: Cambridge University Press.

Meyer, F., Strauss, P. & Funke, T., 2008. Modelling the impacts of macro-economic variables on the South African biofuels industry. *Agrekon*, 47(3), pp.327–345.

Ministry for Agriculture and Land Affairs, 2005. Land an agrarian reform in South Africa: An overview in preparation for the land summits, 27 - 31 July 2005.

Mintrom, M. & Vergari, S., 1996. Advocacy Coalitions, Policy Entrepreneurs, and Policy Change. *Policy Studies Journal*,, 24(3), pp.420–434.

Miranda, S., Swinbank, A. & Yano, Y., 2011. Politikmaßnahmen zu Biokraftstoffen in der EU, den USA und Brasilien. *EuroChoices*, 10(3), pp.11–17.

Mitchell, D., 2008. *A Note on Rising Food Prices*, New York: World Bank (Development Prospects Group).

Moeti, K., 2007. Agriculture, Land Reform and Development In South Africa: Public Policy for Social Upliftment. *African Journal of Public Affairs*, 1(1), pp.28–33.

Mokgoro, J., 2000. Provincial experiences in managing national policies on the transformation of the public service. *Public Administration and Development*, 20(2), pp.141–153.

Mol, A.P.J., 2007. Boundless Biofuels? Between Environmental Sustainability and Vulnerability. *Sociologia Ruralis*, 47(4), pp.297–313.

Monbiot, G., 2004. Feeding cars, not people. *The Guardian*.

Moore, A., 2008. Biofuels are dead: long live biofuels(?) – Part one. *New Biotechnology*, 25(1), pp.6–12.

Mosley, P., 2002. The African green revolution as a pro-poor policy instrument. *Journal of International Development*, 14(6), pp.695–724.

Mosse, D., 2005. *Cultivating development*, London: Pluto Press.

Mosse, D., 2004. Is Good Policy Unimplementable? Reflections on the Ethnography of Aid Policy and Practice. *Development and Change*, 35(4), pp.639–671.

Mtwa, X., 2007. South African Bio-fuels Industrial Strategy. Available at: http://www.unep.org/urban_environment/PDFs/Xolile.pdf [Accessed May 23, 2009].

Mungadze, S., 2013. Davies in bid to cut red tape for SMMEs. *Business Day Live*. Available at: http://www.bdlive.co.za/business/2013/07/04/davies-in-bid-to-cut-red-tape-for-smmes [Accessed August 13, 2013].

NAAMSA, 2005. NAAMSA - Media release on 2005/2006 budget. *NAAMSA*. Available at: http://www.naamsa.co.za/papers/20050331/index.html [Accessed February 24, 2013].

Nagar, S., 2009. Biofuel policy process in India: Context, Actors and Discourses. In The Indian Society for Ecological Economics (INSEE) 5th Biennial Conference; Ahmedabad, India: INSEE. Available at: http://www.ecoinsee.org/fbconf/Sub%20Theme%20C/Shailesh%20Nagar.pdf .

Nagel, T., 1986. *The view from nowhere*, New York: Oxford University Press.

Naidoo, G., 2004. *Leadership and governance for a sustainable public service. The case for selected South African public service organizations*. PhD. Pretoria: University of Pretoria.

National Department of Agriculture, 2002. *The Integrated Food Security Strategy for South Africa*, Pretoria: National Department of Agriculture.

National Planning Commission, 2011a. *Diagnostic Overview*, Pretoria: The Presidency.

National Planning Commission, 2011b. *Institutions and Governance Diagnostic*, Pretoria: The Presidency.

National Planning Commission, 2011c. *National Development Plan*, Pretoria: National Planning Commission.

National Treasury, 2006. Comments on the bio-fuels industrial strategy attached to cabinet memorandum no. 15 of 2006 of the Department of Minerals and Energy.

National Treasury, 2008. Food Prices, the Food Industry and Policy Options for SA.

National Treasury, 2007. The tax policy unit's comments on cabinet memorandum number 12 of 2007: biofuels industrial strategy for the Republic of South Africa.

Neff, M., 2007. Does Science Matter? The Role of Science in Framing Policy Problems. In *Issues in Climate Science and Policy*. Consortium for Science, Policy and Outcomes. Arizona: STGlobal Consortium.

NERSA, 2008. *Inquiry into the national electricity supply shortage and load shedding*, Pretoria: National Energy Regulator of South Africa.

Ngqangani, S., 2010. Employment, Inclusive Growth and Food Security: How can Agriculture Contribute?

Nieuwoudt, L. & Groenewald, J. eds., 2003. The Challenge of Change. Agriculture, Land and the South African Economy. In *The Challenge of Change.*

Agriculture, Land and the South African Economy. Pietermaritzburg: University of Natal Press.

Njobeni, S., 2012. Eskom applies for power tariff increase of 16% a year. *Business Day*. Available at: http://www.bdlive.co.za/business/energy/2012/10/22/eskom-applies-for-power-tariff-increase-of-16-a-year [Accessed February 27, 2013].

Nkomo, J., 2005. Energy and economic development: challenges for South Africa. *Journal of Energy in Southern Africa*, 16(3), pp.10–20.

Nolte, M., 2007. *Commercial Biodiesel Production in South Africa: A preliminary economic feasibility study*. MSc Chemical Engineering. Stellenbosch: University of Stellenboasch.

O'Brien, G., O'Keefe, P. & Rose, J., 2007. Energy, poverty and governance. *International Journal of Environmental Studies*, 64(5), pp.605–616.

O'Flynn, J., 2007. From New Public Management to Public Value: Paradigmatic Change and Managerial Implications. *Australian Journal of Public Administration*, 66(3), pp.353–366.

OECD-FAO, 2007. *OECD-FAO Agricultural Outlook 2007-2016*, Paris: Organisation for Economic Co-Operation and Development and the Food and Agriculture Organization.

Office of the Presidency, 1994. *White Paper on Reconstruction and Development*,

Official Journal of the European Union, 2003. *The promotion of the use of biofuels or other renewable fuels for transport*,

Omamo, S., 2004. Bridging Research, Policy, and Practice in African Agriculture.

Ong, A. & Collier, S., 2006. *Global Assemblages: Technology, Politics and Ethics as Anthropological Problems*, Oxford: Blackwell.

Ortmann, G.F. & King, R.P., 2010. Research on agri-food supply chains in Southern Africa involving small-scale farmers: Current status and future possibilities. *Agrekon*, 49(4), pp.397–417.

Ostrom, E., 1999. An assessment of the Institutional Analysis and Development Framework. In P. A. Sabatier, ed. *Theories of the policy process*. Boulder, Colorado.: Westview Press, pp. 21–64.

Pegels, A., 2010. Renewable energy in South Africa: Potentials, barriers and options for support. *Energy Policy*, 38(9), pp.4945–4954.

Pereira, L.M. & Ruysenaar, S., 2012. Moving from traditional government to new adaptive governance: the changing face of food security responses in South Africa. *Food Security*, 4(1), pp.41–58.

Peskett, L. *et al.*, 2007. *Biofuels, Agriculture and Poverty Reduction*, London: Overseas Development Institute.

PetroSA, 2012. PetroSA – South Africa's National Oil Company. *PetroSA*. Available at: http://www.petrosa.co.za/Pages/Home.aspx [Accessed November 10, 2012].

Pfuderer, S., Davies, G. & Mitchell, I., 2009. The role of demand for biofuel in the agricultural commodity price spikes of 2007/08. Available at: http://www.defra.gov.uk/foodfarm/food/pdf/ag-price-annex%205.pdf [Accessed November 11, 2010].

Philip, K., 2010. Inequality and economic marginalisation: How the structure of the economy impacts on opportunities on the margins. *Law, Democracy & Development*, 14(1). Available at: http://www.ajol.info/index.php/ldd/article/view/68281 [Accessed January 8, 2013].

Phumzile Mlambo-Ngcuka (Deputy President), 2006. *Background Document- A Catalyst for Accelerated and Shared Growth-South Africa (ASGISA),*

PhytoEnergy Development GmbH, 2006. Minutes of meeting - Eastern Cape Bio-fuel Cluster Task Team.

PhytoEnergy Group, 2012. The SAFFARI Initiative. *PhytoEnergy Group*. Available at: http://www.phytoenergy.org/page/saffari [Accessed August 4, 2012].

Pielke, R.A., 2007. *The honest broker making sense of science in policy and politics*, Cambridge; New York: Cambridge University Press. Available at: http://public.eblib.com/EBLPublic/PublicView.do?ptiID=293386 [Accessed July 29, 2012].

Pieterse, J. & van Wyk, B., 2005. *What's Cooking: AIDS Review 2005*, Pretoria: University of Pretoria: Centre for the study of AIDS.

Plaatje, S., 2006. *Native Life in South Africa*, Hard Press.

Planting, S. & Smith, N., 2007. Financial Mail - High and dry. *Financial Mail*. Available at: http://secure.financialmail.co.za/07/0921/cover/coverstory.htm [Accessed March 14, 2012].

Pollitt, C. & Bouckaert, G., 2004. *Public management reform : a comparative analysis*, Oxford; New York: Oxford University Press.

Pothier, M., 2012. *A Fifth Estate? The Role and Power of Civil Society*, Cape Town: South African Catholic Bishops Conference Parliamentary Liaison Office.

Practical Action, 2013. *Poor People's Energy Outlook 2013*, Rugby: Practical Action Publishing.

Practical Action, forthcoming. *Review of Biofuels Policies in selected African Countries: Case study from Zambia, Malawi, Mali, Ghana, South Africa, Uganda, Ethiopia and Tanzania*, Practical Action.

Pradhan, S. & Ruysenaar, S., 2014. Burning Desires- Untangling and Interpreting "Pro-Poor" Biofuel Policy Processes in India and South Africa. *Environment and Planning A*, 46(2), pp.299–317.

Pressman, J.L. & Wildavsky, A.B., 1984. *Implementation: how great expectations in Washington are dashed in Oakland: or, why it's amazing that federal programs work at all, this being a saga of the Economic Development Administration as told by two sympathetic observers who seek to build morals on a foundation of.*, Berkeley, Calif.: University of California.

Prinsloo, L., 2011. SA should step up its biofuels efforts – Toyota. *Engineering News*. Available at: http://www.engineeringnews.co.za/article/sa-should-step-up-its-biofuels-efforts-toyota-2011-08-25 [Accessed June 15, 2012].

Purvis, T. & Hunt, A., 1993. Ideology, Discourse, Ideology, Discourse, Ideology... *The British Journal of Sociology*, 44(3), pp.473–499.

Radebe, H., 2012. Land grants "not meant for weekend farmers." *Business Day*. Available at: http://www.bdlive.co.za/articles/2012/01/27/land-grants-not-meant-for-weekend-farmers [Accessed October 7, 2012].

Ravallion, M., 1989. *Do price increases for staple foods help or hurt the rural poor?* Washington D.C.: Agriculture and Rural Development Dept., World Bank.

Rein, M. & Schön, D., 1993. Reframing Policy Discourse. In F. Fischer & J. Forester, eds. *The Argumentative turn in policy analysis and planning*. Durham, N.C.: Duke University Press, pp. 145–166.

Rep. South Africa, 1996. *The Constitution of the Republic of South Africa*, Pretoria: Government Printer. Available at: www.info.gov.za/documents/constitution/index.htm.

Rich, A., 2004. *Think Tanks, Public Policy, and the Politics of Expertise*, Cambridge: Cambridge University Press.

Richardson, B., 2010. Big Sugar in southern Africa: rural development and the perverted potential of sugar/ethanol exports. *Journal of Peasant Studies*, 37(4), pp.917–938.

Richardson, T., 2006. The Thin Simplification of European Space: Dangerous Calculations? *Comparative European Politics*, 4(2-1), pp.203–217.

Rifkin, J., 2011. *The Third Industrial Revolution: How Lateral Power Is Transforming Energy, the Economy, and the World*, Palgrave Macmillan.

Rittel, H. & Webber, M., 1973. Dilemmas in a General Theory of Planning. *Policy Sciences*, 4, pp.155–169.

Roach, P., 2006. *Capability of Biodiesel manufactures*. Masters of Business Administration. Pretoria: University of Pretoria.

Robèrt, M., Hultén, P. & Frostell, B., 2007. Biofuels in the energy transition beyond peak oil.: A macroscopic study of energy demand in the Stockholm transport system 2030. *Energy*, 32(11), pp.2089–2098.

Roe, E., 1991. Development narratives, Or making the best of Blue Print Development. *World Development*, 19, pp.287–300.

Rose, N. & Miller, P., 1992. Political Power beyond the State: Problematics of Government. *The British Journal of Sociology*, 43(2), pp.173–205.

Roundtable on Sustainable Biofuels, 2010. RSB Principles and Criteria.

Roux, N.L., 2002. Public policy-making and policy analysis in South Africa amidst transformation, change and globalisation : views on participants and role players in the policy analytic procedure. Available at: http://repository.up.ac.za/handle/2263/3881 [Accessed March 14, 2013].

Rumelt, R.P., 2011. *Good strategy, bad strategy: the difference and why it matters*, New York: Crown Business.

Rusco, F. & Walls, W., 2009. Biofuels and the Fungibility of Motor Fuels. *International Association for Energy Economics*, Third Quarter, pp.49–52.

Ruysenaar, S., 2011a. *CURES Southern Africa Bioenergy Capacity Building Workshop Summary Report*, Johannesburg: CURES.

Ruysenaar, S., 2012. Reconsidering the "Letsema Principle" and the Role of Community Gardens in Food Security: Evidence from Gauteng, South Africa. *Urban Forum*, 24(2), pp.219–249.

Ruysenaar, S., 2011b. Rethinking the Food-versus-Fuel Debate: An Appraisal of International Perspectives and Implications for the South African Industrial Biofuels Strategy. *Environment and Society: Advances in Research*, 2(1), pp.124–148.

Ruysenaar, S., 2010. *Systems Analyses and Recommendations for the Homestead Food Security and Community Gardens Programmes of the Gauteng Department of Agriculture and Rural Development (with Reference to wider Implications for the Integrated Food Security Strategy)*, Johannesburg.

Ruysenaar, S.H., 2009. *Silhouettes and Safety Nets: Unpacking National Food Security Policy and Agricultural Interventions in Gauteng, South Africa*. Unpublished MSc. Johannesburg: University of the Witwatersrand.

SABA, 2010. Southern African Biofuels Association - Home. *South African Biofuels Association*. Available at: http://www.saba.za.org/site/ [Accessed February 16, 2010].

Sabatier, P., 1986. Top-Down and Bottom-Up Approaches to Implementation Research: a Critical Analysis and Suggested Synthesis. *Journal of Public Policy*, 6(1), pp.21–48.

Sabatier, P.A., 2007. *Theories of the policy process*, Boulder, Colo.: Westview Press.

Sabatier, P.A. & Jenkins-Smith, H.C., 1993. *Policy change and learning : an advocacy coalition approach*, Boulder, Colo.: Westview Press.

Sachs, W., 2010. *The Development Dictionary: A Guide to Knowledge as Power, Second Edition*, Zed Books.

SACPN, 2012. Renewable energy programme to bring R47 billion in investment. *SA Commercial Property News*. Available at: http://www.sacommercialpropnews.co.za/business-specialties/south-africa-property-infrastructure/5361-renewable-energy-programme-to-bring-r47-billion-in-investment.html [Accessed November 13, 2012].

Sah, R. & Stiglitz, J., 1992. *Peasants Versus City-Dwellers: Taxation and the Burden of Economic Development, Clarendon Press, Oxford.*, Oxford: Clarendon Press.

Sample, I., 2009. Beddington: World faces "perfect storm" of problems by 2030. *Gaurdian.co.uk*. Available at: http://www.guardian.co.uk/science/2009/mar/18/perfect-storm-john-beddington-energy-food-climate [Accessed April 6, 2013].

Sanchez, P.A., Denning, G.L. & Nziguheba, G., 2009. The African Green Revolution moves forward. *Food Security*, 1(1), pp.37–44.

Sanchez, T. & Scott, A., 2009. *Energy poverty: The hidden energy crisis*, Rugby: Practical Action.

Sanderson, I., 2002. Evaluation, Policy Learning and Evidence-Based Policy Making. *Public Administration*, 80(1), pp.1–22.

SAPIA, 2011. *SAPIA 2011 Annual Report*, Johannesburg: South African Petroleum Industry Association.

Scarlat, N. & Dallemand, J.-F., 2011. Recent developments of biofuels/bioenergy sustainability certification: A global overview. *Energy Policy*, 39(3), pp.1630–1646.

Schmeding, H.-F., 2009. *The Agrarian Model: "Ringfencing" Risks of Complex Modernisation Of Rural South African Region, Challenges of Building up Canola Production Analysed by Way of SWOT Analysis*. Master of Science in

Investment Promotion and Economic Development. Edinburgh: Edinburgh Napier University.

Schmidt, M. *et al.*, 2012. Biofuels in General. In M. Schmidt, ed. *Synthetic Biology: Industrial and Environmental Applications*. Weinheim: Wiley-VCH Verlag GmbH & Co, pp. 7–66.

Schmidt, V. & Radaelli, C., 2004. Policy Change and Discourse in Europe: Conceptual and Methodological Issues. *West European Politics*, 27(2), pp.183–210.

Schot, J. & Geels, F.W., 2008. Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy. *Technology Analysis & Strategic Management*, 20(5), pp.537–554.

Schut, M., Slingerland, M. & Locke, A., 2010. Biofuel developments in Mozambique. Update and analysis of policy, potential and reality. *Energy Policy*, 38(9), pp.5151–5165.

Scoones, I., 2012. The "Geeks" Fight Back: Challenges for Science and Democracy. *The Huffington Post UK*. Available at: http://www.huffingtonpost.co.uk/ian-scoones/the-geeks-fight-back-chal_b_1560413.html [Accessed July 18, 2013].

Scoones, I., Devereux, S. & Haddad, L., 2005. Introduction: New Directions for African Agriculture. *IDS Bulletin*, 36(2), pp.1–12.

Searchinger, T. *et al.*, 2009. Fixing a Critical Climate Accounting Error. *Science*, 326, pp.527–528.

Sebitosi, A. & Pillay, P., 2008. Grappling with a half-hearted policy: The case of renewable energy and the environment in South Africa. *Energy Policy*, 36(7), pp.2513–2516.

Seneque, G.C., 1982. *Betterment Planning in South Africa*. Masters of Town and Regional Planning. Durban: University of KwaZulu-Natal.

Sengers, F., Raven, R.P.J.M. & Van Venrooij, A., 2010. From riches to rags: Biofuels, media discourses, and resistance to sustainable energy technologies. *Energy Policy*, 38(9), pp.5013–5027.

Sharman, A. & Holmes, J., 2010. Evidence-based policy or policy-based evidence gathering? Biofuels, the EU and the 10% target. *Environmental Policy and Governance*, 20(5), pp.309–321.

Simon, H., 1957. *Models of Man*, New York: Wiley.

Skocpol, 1985. Bringing the state back in: Strategies in current research. In *Bringing the state back in*. Cambridge [Cambridgeshire] ; New York: Cambridge University Press, pp. 3–43.

Smith, A., 2007. Translating Sustainabilities between Green Niches and Socio-Technical Regimes. *Technology Analysis & Strategic Management*, 19(4), pp.427–450.

Smith, J., 2010. *Biofuels and the globalization of risk: the biggest change in north–south relationships since colonialism?*, London: Zed Books.

Smith, M., 2008. *Multiple Scenario Analysis into the potential for biofuel production from maize in South Africa*. Unpublished MSc. Dissertation. Johannesburg: University of Johannesburg.

Smolker, R., 2008. The New Bioeconomy and the Future of Agriculture. *Development*, 51(4), pp.519–526.

Somlotha, Z., 2011. Agrarian Research and Development Agency.

Songoni, M., 2010. Eastern Cape Agriculture and Rural Development Prov Budget Vote 2010/11. *South African Government Information*. Available at: http://www.info.gov.za/speech/DynamicAction?pageid=461&sid=8916&tid=8933 [Accessed October 19, 2012].

Sonjica, T., 2013. Minister Nkwinti lambasts the lazy.

Sorda, G., Banse, M. & Kemfert, C., 2010. An overview of biofuel policies across the world. *Energy Policy*, 38(11), pp.6977–6988.

South African Biofuels Association, 2007. Comments on the Draft National Biofuels Strategy.

South African Government News Agency, 2011. Renewable energy bidders to be announced during COP 17. *sanews.gov.za*. Available at: http://oldsanews.gcis.gov.za/rss/11/11091415351001 [Accessed August 13, 2012].

South African Petroleum Industry Association, 2009. SAPIA position on the uptake of biofuels into the liquid fuels market.

Spalding-Fecher, R. & Matibe, D.K., 2003. Electricity and externalities in South Africa. *Energy Policy*, 31(8), pp.721–734.

Spalding-Fecher, R., Williams, A. & van Horen, C., 2000. Energy and environment in South Africa: charting a course to sustainability. *Energy for Sustainable Development*, 4(4), pp.8–17.

Stone, D.A., 2002. *Policy paradox: the art of political decision making*, New York [u.a.]: Norton.

Strydom, D., 2009. *The Economic Impact of Maize-based Ethanol Production on the South African Animal Feed Industry*. M.Com Dissertation: Department of Agricultural Economics. Bloemfontein: University of Free State.

Sugar Beet RSA, 2005. *Volume 1 - Bankable Feasibility Study 2005.*, Cradock: Sugar Beet RSA.

Sugrue, A. & Douthwaite, R., 2007. *Biofuel production and the threat to South Africa's food security*, Johannesburg: Regional Hunger & Vulnerability Programme (RHVP). Available at: http://www.sarpn.org.za/documents/d0002509/Biofuel_SA_Wahenga_Apr2007.pdf [Accessed January 23, 2010].

Sulle, E. & Nelson, F., 2009. *Biofuels, land access and rural livelihoods in Tanzania*, London; Arusha Tanzania: International Institute for Environment and Development; Tanzania Natural Resource Forum.

Sumner, A. & Tiwari, M., 2009. *After 2015 : international development policy at a crossroads*, Basingstoke [England]; New York: Palgrave Macmillan.

Suskind, R., 2004. Faith, Certainty and the Presidency of George W. Bush. *The New York Times*. Available at: http://www.nytimes.com/2004/10/17/magazine/17BUSH.html [Accessed July 29, 2012].

Sutton, R., 1999. The policy process: an overview. Available at: internal-pdf://Policy_Process_Sutton-1731961344/Policy_Process_Sutton.pdf.

Swart, C.J., 2010. *The South African Liquid Fuels Market: Yesterday, Today and Tomorrow*. MSc Research Report. Stellenbosch: Stellenbosch University.

Talamini, E. *et al.*, 2013. Scanning the macro-environment for liquid biofuels: A comparative analysis from public policies in Brazil, United States and Germany. *Journal of Strategy and Management*, 6(1), pp.40–60.

Taljaard, R., 2010. Building a public service that can deliver change. In N. Misra-Dexter & J. February, eds. *Testing Democracy: Which Way Is South Africa Going?* Cape Town: IDASA Publishers.

Terreblanche, S.J., 2012. *Lost in transformation: South Africa's search for a new future since 1986*, Sandton: KMM Review publishing.

Terreblanche, S.J., 1999. The Ideological Journey of South Africa. *Religion in Public Life*. Available at: http://web.uct.ac.za/depts/ricsa/confer/me99/procs/pro_terr.htm [Accessed March 13, 2013].

The Economist, 1999. Race, law and poverty in the new South Africa. *The Economist*. Available at: http://www.economist.com/node/244570 [Accessed February 20, 2013].

The Economist, 2012. South Africa: Over the rainbow. *The Economist*. Available at: http://www.economist.com/news/briefing/21564829-it-has-made-progress-

becoming-full-democracy-1994-failure-leadership-means [Accessed December 15, 2012].

The Presidency, 2006. Clarifying the Second Economy Concept.

The Presidency, 2009a. Development Indicators Report 2009.

The Presidency, 2009b. Presidency on reconfiguration of Ministerial Clusters. *South African Government Information*. Available at: http://www.info.gov.za/speeches/2009/09101916051003.htm [Accessed October 26, 2012].

The Royal Society, 2008. *Sustainable biofuels: prospects and challenges*, London: the Royal Society.

Thelen, K., 1999. Historical Institutionalism in Comparative Politics. *Annu. Rev. Polit. Sci.*, 2, p.369—404.

Thompson, L. & African Centre for Citizenship and Democracy, 2007. *Participatory governance?: citizens and the state in South Africa*, Bellville, South Africa: African Centre for Citizenship and Democracy, University of the Western Cape.

Thompson, L.M., 2001. *A history of South Africa* 3rd ed., New Haven, CT: Yale University Press.

Tilman, D. *et al.*, 2009. Beneficial Biofuels—The Food, Energy, and Environment Trilemma. *Science*, 325, pp.270–271.

Timmer, C., Falcon, W. & Pearson, S., 1983. *Food Policy Analysis*, Baltimore: Johns Hopkins University Press.

Tomlinson, R., 2002. International Best Practice, Enabling Frameworks and the Policy Process: A South African Case Study. *International Journal of Urban and Regional Research*, 26(2), pp.377–388.

Torgerson, D., 1985. Contextual orientation in policy analysis: The contribution of Harold D. Lasswell. *Policy Sciences*, 18(3), pp.241–261.

Trimmer, P., 2005. *Agriculture and pro-poor growth: An Asian perspective*, Centre for Global Development. Available at: http://www.cgdev.org/content/publications/detail/2986/ [Accessed June 12, 2007].

Trollip, H., 1996. *Overview of the South African energy sector*, Pretoria: Department of Minerals and Energy.

Tsikata, M. & Sebitosi, A.B., 2010. Struggling to wean a society away from a century-old legacy of coal based power: Challenges and possibilities for South African Electric supply future. *Energy*, 35(3), pp.1281–1288.

Turok, B., 2008. *From the Freedom Charter to Polokwane: The Evolution of ANC Economic Policy*, New Agenda: South African Journal of Social and Economic Policy.

Turok, I., 2010. Towards a developmental state? Provincial economic policy in South Africa. *Development Southern Africa*, 27(4), pp.497–515.

United Nations Development Programme, 2003. *South Africa Human Development Report 2003*, Oxford; New York: Oxford University Press.

Unruh, G.C., 2000. Understanding carbon lock-in. *Energy Policy*, 28(12), pp.817–830.

Urry, J., 2003. *Global complexity*, Malden, MA: Polity.

Vene-Klasen, L. & Miller, V., 2002. *A New Weave of Power, People & Politics: The Action Guide for Advocacy and Citizen Participation*, Rugby: Practical Action Publishing. Available at: http://www.justassociates.org/en/resources/new-weave-power-people-politics-action-guide-advocacy-and-citizen-participation [Accessed September 16, 2013].

Viljoen, D. & Sekhampu, T.J., 2013. The Impact of Apartheid on Urban Poverty in South Africa: What we can Learn from History. *Mediterranean Journal of Social Sciences*, 4(2), pp.730–734.

Vink, N., 2001. Small farmer research in South Africa: A Survey. *Agrekon*, 40(2), pp.130–186.

Vink, N. & Kirsten, J., 2003. Agriculture in the national Economy. In *The Challenge of Change*. Scottsville: University of Natal Press, pp. 3–21.

Vink, N., Kirsten, J. & Van Zyl, J., 2000. Agricultural Policy: Undoing the legacy of the past. In *South African Agriculture at the Crossroads*. Basingstoke: Macmillan.

Vink, N. & Van Rooyen, J., 2009. *The economic performance of agriculture in South Africa since 1994: Implications for food security.*, Midrand: Development Bank of Southern Africa.

Visagie, E. & Prasad, G., 2006. *Renewable energy technologies for poverty alleviation. South Africa: Biodiesel and solar water heaters*. Cape Town: University of Cape Town.

Visser, W., 2004. “Shifting RDP into GEAR”. The ANC Government’s dilemma in providing an equitable system of social security for the “new” South Africa. *ITH-Tagungsberichte*, 39, pp.105–124.

Vivier, J., Gildenhuys, H. & Lerm, N., 2009. *Environmental Impact Report as part of the Environmental Impact Assessment for the Proposed Cradock Ethanol Plant*, Pretoria: AGES SA.

Wakeford, J., 2007. ASPO-SA: Response to the Draft Biofuels Strategy. Available at: http://aspo.org.za/index.php?option=com_content&task=view&id=44&Itemid=31 [Accessed March 2, 2010].

Wakeford, J., 2012. Coega refinery a costly cul-de-sac. *Engineering News*. Available at: http://www.engineeringnews.co.za/article/coega-refinery-a-costly-cul-de-sac-2012-10-26 [Accessed October 26, 2012].

Water Research Commission, 2004. Water control ensures Great Fish River Valley remains land of milk & honey. *Water Wheel*, 3(2), pp.13–15.

Webb, P. & Rogers, B., 2003. *Putting the "in" back in food insecurity*, USAID.

Weber, M. *et al.*, 1988. Informing food security decisions in Africa: Empirical analysis and policy dialogue. *American Journal of Agricultural Economics*, 70(5), pp.1044–1052.

Weber, M. & Parsons, T., 2012. *Max Weber the theory of social and economic organization*, Mansfield Centre, CT: Martino Publishing.

Weber, M. & Parsons, T., 2003. *The Protestant ethic and the spirit of capitalism*, Mineola, N.Y.: Dover Publications.

Weeks, J., 1999. Stuck in low GEAR? Macroeconomic policy in South Africa, 1996–98. *Cambridge Journal of Economics*, 23, pp.795–811.

Weinberg, A.M., 1972. Science and trans-science. *Minerva*, 10, pp.209–222.

White, B. & Dasgupta, A., 2010. Agrofuels capitalism: a view from political economy. *Journal of Peasant Studies*, 37(4), pp.593–607.

Wildavsky, A.B., 1987. *Speaking truth to power : the art and craft of policy analysis*, New Brunswick, USA: Transaction Books.

Wilkinson, J. & Herrera, S., 2010. Biofuels in Brazil: debates and impacts. *Journal of Peasant Studies*, 37(4), pp.749–768.

Wilson, E., Wood, R.G. & Garside, B., 2012. *Sustainable energy for all? Linking poor communities to modern energy services*, London: International Institute for Environment and Development.

Wilson, S. *et al.*, 2005. *Review of the Status of Biodiesel Related Activities in South Africa*, Cape Town: British High Commission (supported).

Wilson, S. & McDaid, L., 2007. *Introducing Biofuels to the City of Cape Town*, Cape Town: African Sustainable Fuels Centre.

Winkler, H., 2006. *Energy policies for sustainable development in South Africa*, Cape Town: Energy Research Centre, University of Cape Town.

Winkler, H., 2005. Renewable energy policy in South Africa: policy options for renewable electricity. *Energy Policy*, 33(1), pp.27–38.

Wolde-Georgis, T. & Glantz, M., 2009. *Biofuels in Africa: A Pathway to Development*, Boulder (Colorado): International Research Centre for Energy and Economic Development.

Woods, J., 2006. *Bioenergy and Agriculture: Promises and Challenges. Science and Technology Options for Harnessing Bioenergy's Potential*, Washington D.C.: IFPRI.

World Bank, 2008. *Biofuels: the promise and the risks*, The World Bank.

World Bank, 1986. *Poverty and Hunger: Issues and options for food security in developing countries.*, Bank, World: World Bank.

World Bank, 2007. *World development report 2008: agriculture for development*, Washington, D.C. : London: World Bank; Eurospan [distributor].

World Bank & DFID, 2011. *How Do We Improve Public Expenditure in Agriculture?*, Washington D.C.: The World Bank.

Worrall, D., 2013. Mamphela Ramphele, the Budget & food security. *Polity*. Available at: http://www.polity.org.za/article/mamphela-ramphele-the-budget-food-security-2013-03-01?utm_source=Creamer+Media+FDE+service&utm_medium=email&utm_campaign=Polity+Daily+News%3A+SA+moves+to+shore+up+African+%E2%80%98gateway%E2%80%99+status+amid+concerns&utm_term=http%3A%2F%2Fwww.polity.org.za%2Farticle%2Fmamphela-ramphele-the-budget-food-security-2013-03-01 [Accessed March 3, 2013].

Yanow, D., 1996. *How does a policy mean? interpreting policy and organizational actions*, Washington, D.C.: Georgetown University Press. Available at: http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=21694 [Accessed August 13, 2012].

Yanow, D., 2007. Interpretation in policy analysis: On methods and practice. *Critical Policy Studies*, 1(1), pp.110–122.

Yearley, S., 2005. *Making sense of science: understanding the social study of science*, London: SAGE.

Young, O., 2002. *The institutional dimensions of Environmental Change: Fit, Interplay and Scale*, Massachusetts: MIT Press.

Zahariadis, N., 1999. Ambiguity, Time and Multiple Streams. In P. Sabatier, ed. *Theories of the policy process*. Boulder, Colo.: Westview Press, pp. 73–97.

Ziolkowska, J. *et al.*, 2011. Targets and Mandates: Lessons Learned from EU and US Biofuels Policy Mechanisms. Available at: http://www.agbioforum.org/v13n4/v13n4a13-ziolkowska.htm [Accessed April 22, 2013].

Van Zyl, J. *et al.*, 2001. South African Agriculture in transition: The 1990s. *Journal of International Development*, 13, pp.725–739.

Van Zyl, J. & Coetzee, G., 1990. Food security and structural adjustment: Empirical evidence on the food price dilemma in Southern Africa. *Development Southern Africa*, 7(1), pp.105–116.

Van Zyl, J. & Kirsten, J., 1992. Food Security in South Africa. *Agrekon*, 31(4), pp.170–184.

Von Braun, J., 2008. When Food Makes Fuel: The Promises and Challenges of Biofuels. Available at: http://www.donorplatform.org/component/option,com_docman/task,doc_view/gid,685/ [Accessed November 21, 2009].

Von Braun, J., Swaminathan, M. & Rosegrant, M., 2004. *Agriculture, food security, nutrition and the millennium development goals*, Washington D.C.: International Food Policy Research Institute.

Von Holdt, K., 2010. Nationalism, Bureaucracy and the Developmental State: The South African Case. *South African Review of Sociology*, 41(1), pp.4–27.

Von Holdt, K. & Webster, E., 2005. Work Restructuring and the Crisis of Social Reproduction: A Southern Perspective. In K. Von Holdt & E. Webster, eds. *Beyond the Apartheid Workplace: Studies in Transition*. Pietermaritzburg: University of Kwazulu-Natal Press, pp. 3–40.

Von Maltitz, G. *et al.*, 2009. *Analysis of opportunities for biofuel production in sub-Saharan Africa*, Bogor (Indonesia): Center for International Forestry Research (CIFOR).

Von Maltitz, G., 2011. Management Models for Biofuels.

Von Maltitz, G. & Brent, A., 2008. *Assessing the biofuel options for Southern Africa*, Pretoria: CSIR.

APPENDIX A: TECHNICAL BACKGROUND TO BIOFUELS

The term 'biofuels' is generally used to describe liquid or gaseous fuels that are predominantly produced from biomass for use in the transport sector (Demirbas 2006). Apart from a post-development orientated criticism of the buzzword *bio*fuels, as opposed to the more representative label *agro*fuels,[1] there is a more particular confusion[2] or misleading overlap in the way in which the terms 'biofuels' and 'bioenergy' are used. Such perplexity is important as it blurs what exactly is being classified; *nomen est numen*. The PISCES group (Clements 2008), for example, consider bioenergy to consist of bioresources (energy derived from natural sources including trees, bushes, grasses), bioresidues (energy derived from left over material from existing agriculture, industry or forest practices) and biofuels, which are produced from purposely grown energy crops including sugarcane, cassava, maize, palm oil and sorghum, as well as wood and forestry cultivation such as coppicing. However, the latter two clearly overlap, given that 'biofuels', that is fuels produced from biological material, may also be derived from 'bioresidues', as some (second–generation) biofuels are. The classification here confuses the source of the energy

[1] There is significant contestation as to the use and definition of the term 'biofuels'. Entwined into the fabric of a much broader debate around 'what' and 'whose' development, terming 'bio-fuels' with the prefix 'bio' subtly implies that the energy in question comes from 'life', but this is illegitimate and manipulative (an argument put forward by the Via Campesina movement). For Via Campesina, a more accurate term that describes the specific origins of a biofuel feedstock would be 'agro-fuels'. The former representation masks their production as economically and environmentally innocuous, disguising their actual commercial interests and resultant capitalist exploitation. Following nomenclature within the South African Biofuels Industrial Strategy Document, in this thesis biofuels and agrofuels are used synonymously and biofuels will be used as the term of choice. This should not be taken as a denial of the important discursive traits embedded in the term.

[2] Although the discussion that follows in this section may be considered superfluous, I have included it purely because I have seen and been involved in various debates about this very issue; all of which have come to different conclusions and some of which have not been concluded. The difficulty it seems is taking what are complex processes and technical terms for specific fuels (energy carriers) and using general classifications that indiscriminately cross boundaries into utilization and feedstocks as well (not to mention the development orientation being implied). The debate might also be further clarified by considering explicitly chemical definitions of individual biofuels such as that for biodiesel as a:

> mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats which conform to ASTM D6751 specifications for use in diesel engines. Biodiesel refers to the pure fuel before blending with diesel fuel. Biodiesel blends are denoted as, "BXX" with "XX" representing the biodiesel per cent contained in the blend (i.e.: B20 is 20% biodiesel, 80% petroleum diesel) (Wilson *et al.* 2005, p.14).

with the type of energy source produced. For similar reasons, Magdoff (2008, p.35) suggests biofuels be differentiated by "the biological material used (the feedstock), the process for conversion of the feedstock to fuel, and the actual type of fuel produced".[3] It is a useful approach; however, he then specifies four basic types of 'biofuels' as:

i. direct combustion (of wood products, crop residues);
ii. ethanol (produced from sugars, starches, or cellulose);
iii. biodiesel (produced from oil crops or waste cooking oil); and
iv. methane (natural gas, produced from digestion of animal manures or human sewage).

These I would consider as types of bioenergy, rather than types of 'biofuel' as direct combustion is an exchange of energy whilst the rest are fuel/energy carriers. Magdoff (2008) therefore somewhat breaks with his own convention. For the purposes of this thesis, I therefore consider biofuels as those fuels specifically used as a substitute for liquid petroleum (a fossil fuel) and derived from purposely grown crops and residues; bioethanol (as substitute for but more likely used as an additive to petrol) and biodiesel (as a substitute for diesel) being the most important. In addition to these first-generation biofuels (derived from the carbohydrates of the crop itself), second-generation biofuels are produced from the cellulose of bio-residues or other sources of biomass.[4] Bio-energy then refers to all energy (e.g. liquid biofuels, solid biomass and biogas) derived from biomass but focus here will be on bioethanol and biodiesel. Bioenergy is therefore a far more encompassing term, and extends from small-scale applications (e.g. biogas at household level) to biofuels (e.g. large-scale industrial applications).

Bioethanol is produced predominantly from carbohydrate-rich crops including starch-rich cereals[5] such as maize or wheat, and sugar-rich crops such as sugarcane

[3] This appears to be more common in the USA in which biofuel and bio-energy are used interchangeably.

[4] Third- and fourth-generation biofuels have also entered into the lexicon (though are not particularly new to the science), referring to algal-based production and advanced biotechnology respectively. Neither of these is specifically important for the purposes of this thesis but they are important technological endeavours regardless.

[5] Starches are complex carbohydrates (or long saccharides) that need to be broken down into simple sugars (glucose) before one can produce ethanol. For this reason, crops such as sugarcane and

or sugar beet (Peters and Thielman, 2008). Bioethanol is derived from alcoholic fermentation of sucrose or simple sugars, which are produced from biomass by hydrolysis (Demirbas, 2006). Bioethanol, which has a lower calorific value than petrol, can be used in combination with normal fuel (typically at a ten per cent mixing ratio, referred to as E10) in older petrol-driven engines although mixing within the existing fuel supply presents some challenges (see Rusco & Walls 2009 and below). There has been, for example, some resistance by fuel companies to mixing bioethanol into the existing infrastructure given the capital expenditure required. Other major issues include:

- Removing existing aromatics and mixing ratios. Although not a result of mixing biofuel *per se*, South Africa has drafted new regulations moving the fuel sector to Clean Fuels 2 (see Appendix E). Octane enhancers such as methyl-tertiary-butyl-ether (MTBE) and other aromatics will therefore need to be replaced. Bioethanol is a likely but not an automatic substitute. If mixing was mandated, some aromatics would have to be removed regardless to maintain vapour pressure, volatility and octane, however, depending on the mixing ratio, these indices change and thus different refineries react differently and require different technological modifications. Other operating issues arise with blends above E20, such as (i) higher aldehyde emissions, (ii) corrosiveness, affecting metallic parts (iii) higher latent heat of vaporisation causing engine-start problems, (iv) higher evaporation losses due to higher vapour pressure and (v) requiring large fuel tank due to lower calorific value (Wilson *et al*. 2005).
- Affinity to water: Ethanol is hygroscopic, meaning it absorbs water. This requires the entire fuel system be desiccated and waterproofed, making storage especially difficult. It is also not only a problem for refineries but fuel systems in vehicles as well. An ethanol blend has a specific ‘shelf life’ after which it needs to be replaced entirely. Water absorbed by ethanol can produce a ‘slurry’ or phase separation within fuel tanks—the fuel separates into a lighter ethanol-gasoline layer and a heavier water-ethanol one within the tank.

---

sugarbeet in which the glucose is more readily available, are preferable and more efficient to produce bioethanol.

- Blending location and transport infrastructure: Storage issues also depend on where the ethanol will be mixed. If it is mixed at the refinery a specific set of infrastructure is needed, but this would be different if ethanol is mixed at the pump. Wherever it is mixed, there may be fungibility (volumetric equivalence) issues unless specific blends are mandated nationally and all fuel infrastructures, especially the main pipeline are upgraded to handle the prescribed ethanol mixes. As ethanol concentrations change, so too does the energy content and volume of the fuel mix.
- Only modified engines can be run on pure bioethanol[6] and there is also only limited potential for small-scale refining of bioethanol given the chemistry and costs involved.

Biodiesel is produced from oleaginous (oil-rich) crops such as *jatropha*, canola (Rape seed), oil palm, pongamia and soya. Vegetable oils are transesterified (see Bridgwater 2006 for discussion), requiring methanol, a catalyst (sodium or potassium) and heat. The production process is technically simple and can operate at almost any scale and using a variety of fats or oils, which makes it technically feasible for farmers to produce their own biodiesel (Von Maltitz & Brent 2008). Although technically feasible, recent studies in South Africa suggest that this is still not economically viable (KZN DoA 2010). Older indirect injection diesel engines are usually able to use pure biodiesel, however, additives are usually necessary, especially in direct injection engines to ensure they are not damaged. Biodiesel itself may 'gel' and degrade over time[7] causing blockages. In South Africa, biodiesel, and bioethanol, are proposed only as additives to fuels and so are unlikely to create considerable issues for motor vehicles, however, the National Association of Automobile Manufacturers of South Africa (NAAMSA) has until recently argued against the introduction of biofuels.[8]

[6] The main concern here is that pure ethanol or fuel mixes dominated by ethanol might degrade certain rubbers, plastics and metals in the fuel system. Conversion kits are available to ensure such problems do not arise but come at additional costs.

[7] When made from oils with high iodine values, (which are the best for cold weather) the fuel runs the risk of polymerizing (turning into an insoluble plastic-like material) (http://www.answers-to-your-biodiesel-questions.com provides a useful overview).

[8] We will encounter this situation again in later discussions. In short, during the early development of the strategy, NAAMSA were reluctant to support biofuels and suggested that car manufacturer warranty's would not be honoured if car owners used biofuels (despite this being the norm in

There are varieties of processes that produce the different biofuels (Figure 7). Common to both bioethanol and biodiesel, a six-stage life cycle is followed in the production of biofuels. This includes the following (Von Maltitz and Brent, 2008):

- feedstock production - the cultivation of biomass for feedstock;
- feedstock processing - the harvesting, storing, transporting and initial preparation of the feedstock for conversion to fuels;
- bioenergy conversion - the process of converting the feedstock bioenergy into biofuels, either by mechanical, chemical or biological means;
- biofuels transformation - the transformation of the primary biofuels into the final liquid fuel products;
- fuel distribution - the distribution of the produced fuels to the market;
- fuel market - the end user of the fuels.

At this point, it is worth flagging that what sets biofuels, or rather bioenergy, apart from other renewable energy technologies, and why it has such important implications for rural development, is the first stage of the production process. As biofuels rely on feedstock production, increased biofuel production has important backward and forward linkages within the wider agro-economy. The advantages and disadvantages of such back and forward linkages depends on the type of biofuel being produced—first- and second-generation biofuels—the drivers involved (and speed of their uptake) and the type of agricultural production followed.

Europe and elsewhere). However, as a vehicle exporting country, car manufacturers were producing two standards of vehicle; one for the domestic market that would use Euro 2 fuel specifications and a second export standard that would use Euro 5-a cleaner fuel specification used in Europe. Obviously producing two standards of car was inefficient so there was pressure on for South African authorities to impose new fuel standards, which thus required cleaner fuels and has, apparently opened up the gateway for biofuels. NAAMSA now appear broadly in support of if not driving a biofuels agenda, so long as the fuels are produced to specification.

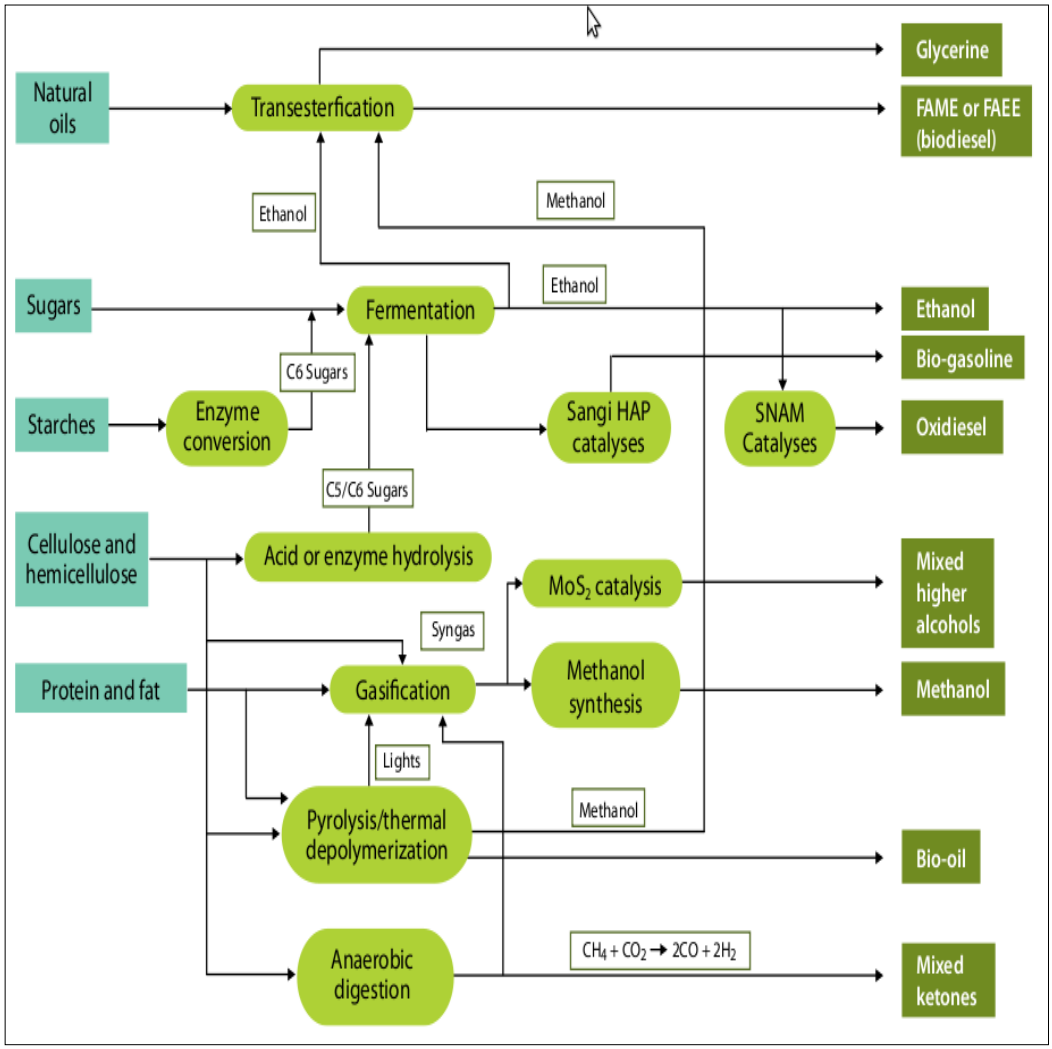


Figure 7: Integrated technology pathways to produce biofuels (adapted from Pike *et al.* 2008)

The current production of 'first generation' biofuels described above depends predominantly on feedstock derived from food crops. Production for first-generation biofuels therefore competes directly with that for food markets and interacts more directly with the existing agro-food system. Magdoff (2008, p.36) suggests that the "holy grail" of ethanol production is to find an economically feasible process for the conversion of cellulose into ethanol. By using cellulose, a structural material in plants, these so-called second-generation biofuels can therefore take advantage of what biomass may be left over, once crops have already been harvested for food production. Second generation biofuels may therefore circumvent such competition

by taking advantage of alternative feedstock for production purposes.[9] Recent proponents of biofuel production use second-generation technology as the 'end all' of the food security debate, despite the technology still being developed (set to be 'online' 2015 according to IIED (2009); see also Vermeulen *et al.,* 2009). This too ignores an increasingly complex interrelationship between food, feed and fuel production (McMichael 2010b; Ruysenaar 2011b). Such complexities will be dealt with later, beforehand, it is important to acknowledge a second defining feature of biofuels, which has both policy implications and results from policy prescriptions; their rapid uptake.

Trends in and Drivers of Biofuel Production[10]

Although biofuel production is in no way a new phenomenon, in recent years it has increased significantly.[11] Since 2000, global bioethanol supply doubled to over 40 billion litres in 2007 (Renewables, 2007; World Bank, 2008) Global bioethanol production is dominated (90 per cent) by Brazilian Sugarcane and US maize (World Bank, 2008). Whilst there is a general perception that Brazil leads the market in the production and export of bioethanol, the USA has eclipsed them following generous subsidies for 'corn ethanol' (Balat 2007). (Subsequently, the US Congress allowed these subsidies to expire in 2011 (Lever 2012)). Biodiesel production is significantly lower but has expanded in the last four years to around ten billion litres in 2007. The EU dominates biodiesel use, producing about 75 per cent of the 6.5billion litres of biodiesel produced in 2006 (World Bank, 2008). In the future, notable increases in demand for biofuels are anticipated from the USA, Brazil, EU, China and India amongst others.

[9] Second generation biofuels include lignocellulose digestion, fast pyrolysis, and Fischer-Tropsch (gasification) technologies, which suggest that a wide range of fast-growing, non-agricultural crops (or crop residuals), including grass, algae or fast-growing trees, may be viable feedstock for liquid biofuels in the not-too-distant future. These too are not unproblematic as much of the technology may be out of reach for developing countries. Even if the technology is provided, it also means that local producers are unlikely to benefit greatly - being exporters of feedstock rather than beneficiated biofuels. It would also be myopic to assume that with this new technology there are no risks, especially at the scales at which production would have to occur.

[10] Although these figures are dated, I have kept them as it was during the period covered by these stats in which the South African Industrial Biofuels Strategy was developed. Statistics that are more recent can be found in the annual F.O. Licht's World Ethanol and Biofuels Report.

[11] Both Henry Ford's first car - the quadricycle - and Rudolph Diesel's original engines were designed to run on biofuels; ethanol and peanut oil respectively (see Schubart, 2006; Eikeland 2006).

The rise in crude oil prices during the middle of 2000 together with concerns about greenhouse gas abatement and energy security has resulted in a sharp increase in biofuel production and related policy measures (Hertel *et al.* 2008; see Chapter 1). One of the significant drivers pushing policymakers towards biofuels production is declining global oil reserves with increasing consumption. It is predicted that by 2025 the global demand for petroleum will have increased between 40-50 per cent (Rooney *et al*., 2007, Johnston and Holloway, 2007). At the same time, the rate at which conventional oil production can be increased has been reduced by the lack of refining capacity, and the fact that nearly fifty per cent of the world's proven and probable conventional light crude oil reserves have already been consumed (USGS, 2004). Collective fears of diminishing fuel supply and energy security have thus pushed up oil prices (although the global recession in 2008 prompted a short-term decline), increasingly making biofuels more financially competitive as one alternative but remain inadequate as a complete substitute.

The rapid demand and anticipated uptake of biofuels also results from a variety of other push and pull factors with policies created to take advantage and compel their uptake. In doing so policy has become a major push factor itself. In general, biofuels are considered as 'relevant' technologies for both developing and industrialised countries for several reasons, including energy security, environmental concerns, foreign exchange savings, and socio-economic issues related to the rural sector (Demirbas 2006; Demirbas & Demirbas 2007; Von Maltitz & Brent 2008). Conversely, other authors are critical of the global drive towards a biofuels economy, highlighting the potential impacts on food security, poor energy efficiencies and potential environmental harm (Gallagher 2008; Mitchell 2008; The Royal Society 2008).

While drivers provide some idea as to why biofuels are being supported, they lack detail as to how such uptake is managed and what the implications might be. In the 2008 World Development Report, the World Bank (World Bank 2008) outlines three key issues that need to be critically assessed when considering the development of

large-scale biofuels programmes – those being economic, environmental and social considerations (World Bank, 2008).

APPENDIX B: INTERVIEW SCHEMATIC AND LIST OF RESPONDENTS

Table 4: List of respondents (note: not all respondents are included)

Respondent	Affiliation[1]	Respondent	Affiliation
National Level		National Level (continued)	
Alf Stevens	EPASA	Nadia Moosa	DME
Andre Kudlinski	DTI	Normawethu Qase	Department of Energy
Anthony Butler	Wits University	Phillip Bouwer	Mabele Fuels
Annie Sugrue	CURES/Independent consultant	Phindile Masangane	CEF/EDC
Andrew Makanete	SABA/Independent consultant	Raoul Goosen	Independent Consultant/IDC
Anthon Moulden	SAPIA	Rod Crompton	DME/NERSA
Asogan Moodaly	IDC/Private consultant/Mabele Fuels	Petrus Brits	Agricultural Research Council
At van Coller	Department of Agriculture	Sandile Tyatya	DME/Potchefstroom Municipality
Brett Dawson	DME	Simon Wilson	African Sustainable Fuels Centre
Brian Tait	Sasol/Independent consultant	William Gumede	DME/Independent Consultant
Charles Siphughu	MMI	Terry Le Roux	Independent Consultant
Charles Cox	Nollen Group (Bioenergy)	Vanessa Black	Independent Consultant
Derek Mathews	Silversands (Bioethanol)	Zakhele Gumede	Ubuhle Biofuels
Ehard Seiler	German Business Chamber/SABA	Thomas Funke	BFAP/SASA
Erwin Obermeyer	National Treasury/SARS	Thabo Kekana	IDC
Ferdi Meyer	BFAP	Wessel Lemmer	Grain SA
Greg Austin	Agama Energy	Somila Xhosa	DST
Graham Von Maltitz	CSIR	Wolfgang Fechter	Tongaat-Hullet

[1] These affiliations are provided for reference sake. They do not mean that the informants were expressing the formal positions of the agencies they were affiliated with. Many of these representatives have also since moved to new companies as well.

Hantie Hoogkammer	Mafikeng Biodiesel Project	Xolile Mtwa	DME
Hein Baak	DoE	Thuthukile Mosia	CEF
Helene Rask Gron	DME consultant	Julia Kupka	ABSA
Jimmy Weir-Smith	Department of Agriculture	Liz McDaid	African Sustainable Fuels Centre
Kevin Nassiep	DME/SANEDI	Manny Singh	CEF/Basil Read
Khanyiso Zihlangu	DoE	Marjorie Pioos	DST
Mark Beare	Independent Consultant		

Eastern Cape		Eastern Cape - Cradock	
Andre Bezuidenhout	Feedtek/ABAC	Albert Van Der Walt	Cradock Coerant
Andrew Murray	Eastern Cape Socio-economic Consultative Council (ECSECC)	'Bull' Jordan	Farmer
		Flippie Marais	Farmer
		Hans Vosloo	SBRSA
Charles Warren-Hansen	KPMG/Phyto Energy	Lusapha and Lucky	Crop Managers at ARDA
Chris Etmmayer	East London IDZ	Jurrie Jordaan	Farmer
Dumisa Maliti	ASGISA-EC	Hilton Collet	SBRSA/ARDA
Fanie Ferraira	GeoTerraImage	Peter Prince	PGBI
Felix Hobson	ECDALA	Phillip Antrobus	Farmer
Leon Coetzee	ECDALA	Riaan van der Walt	Cradock Coerant
Luvo Qongqo	Asgisa-EC	Richard Schulze	Cradock Councilor
Garth Combray	Makana Meadery	Roak Crew	SBRSA/ARDA
Jacques Du Preez	Contract Farmer	Roger McClaughlin	SBRSA/ARDA
Ken Burn	ECDC	Volker Fischer	SBRSA/Ind. consultant
Gary Farr	Rainbow Nation Renewables		
Petrus Fouche	Phyto Energy		
Mark Wells	Independent Consultant		
Nic Hugow	Rural Livelihoods Programme (East London)		
Tim Wiggley	Earth Harmony Innovators		

QUESTIONNAIRE USED TO GUIDE INTERVIEWS

Introduction

The first few questions I want to go through will take us through the actual development of the strategy from its earliest origins to the drafting of the final strategy. The second part unpacks current nature of the strategy and resultant projects. I will be using this information to gain a nuanced understanding of the way policies are created in South Africa, as well as to outline the lessons learned specific to biofuels policy (and the inherent challenges to formulating strategies around such complex agendas). There are no right or wrong answers and the questions are open ended.

Section 1: Development of the Strategy

Could you describe to me how you were involved in the phases of the policy development and when you became involved?

Depending on this, could you describe your perceptions (briefly summarise) what happened in the following stages:

1. Origins, before and up to Task Team?
    - Why was it an industrial focus or only liquid fuels that was considered?
    - Who were the main vested interests in the development of a biofuels strategy and why?
    - Were there any international influences?
    - There has also been mention of various cabinet memos drafted (2004 then 2005 etc.) with job projections but no-one not even the DME (split) has got them – do you know of them, their details and where I might get a copy of them?

2. The feasibility - who, why, what (How were the initial terms of reference for the biofuels strategy or feasibility set up - I want to look at the role of discourse and received wisdom when it comes to policymaking... how do you know what to put into feasibility).
    - Would anyone in particular have influence of the ToR for feasibility or the Strategy at large – details?

3. Do you think there were any problems with the Feasibility Study itself?

4. Where can I get a copy of the reports that were included but confidential in the feasibility [(i) land availability and (ii) potential yields and why the need for such secrecy at the time of their development]?

5. Was there any consultation after/during feasibility?

6. The draft policy – who were the main people drawing up the draft policy and how was the Feasibility Study included?
    - Key players here in the Task Team and why were they the most active?
    - Who was missing from the drafting process?
    - Did civil society play any role and were there any consultants or private sector interests drawing up the Strategy itself?
    - Has there been co-operation between multiple-parties and what were the successes and challenges? Essentially was the Task Team working and why/why not?
    - Is this endemic to all Task Teams in South Africa?

7. Why did the draft policy leave out many of the nuances and issues included in the feasibility? It seems to be quite vague?

8. Tell me what you think about the consultation after the draft strategy was released – what were the main objections and how was the consultation process undertaken?
    - Do you think this was useful?

9. Consultation and the road show – I am interested especially here in the Eastern Cape – it seems they had already put their own strategy together- is this so and how is this so?
    - Were there any notable challenges and successes of the road show?
    - Additionally, there seems to be already very weak foundations to the strategy – given the feasibility and draft being heavily criticised – how is it that the process continued?

10. Final strategy – how then were the consultations included in the final document.
    - This document seems even vaguer, was that for a reason? Are gaps left in the strategy for a reason?
    - There are dramatic shifts in the reasoning and approaches/drivers from Feasibility to the Final Strategy – could you outline what you think the original approaches were (objectives of the strategy) and why the changes have occurred (what they became and why).
    - What role did either the unions or Asgisa (which was been developed at the same time) have in the overall policy process?
    - Maintaining the industrial focus in the final strategy, what kind of "development" (in terms of job creation/livelihoods) does this make possible and did you think that it was the right approach – why?

11. Up to now what has happened, have you been involved? (If yes, move to Section 2…)

Section 2: Current "Policy" and Projects

1. Could you outline the key players in the Task Team currently - Please focus on the most active participants and why this is so?
    - Has this Task Team been problematic at all? How/Why?
    - Are there any consultants etc. currently working with the Task Team – who and why?

2. Who is missing from the process?
    - Have any departments or groups been sidelined?
    - Has civil society played any role in the current workings of the Biofuels Task Team?
    - What has happened to the Task Team – appears to have been a hiatus until this year?

3. If not answered in Section 1: What are the major goals or priorities (food security, rural development, energy security) of pursuing a biofuels industry and do you think these are or will be realised? i.e Why biofuels for SA?

4. What is the nature of a "strategy" in South Africa and how does this differ from a "policy"?

- Does this have any specific implications for the way things are implemented and has this been the case for the biofuels strategy?
- The strategy appears quite vague in terms of operationalisation, is it because the provinces need to come up with their own plans and is this type of decentralisation likely to happen?
- What are most pressing challenges in the implementation of the "strategy"?

5. Should we be considering alternative policy options and what would these be?

6. Could you provide an outline of the major biofuels projects if any and how has the strategy affected the industry?
    - Do the current projects match the goals of the strategy – Discuss?
    - Do you think the industry is a sustainable and sensible one – discuss?
    - Is there sufficient technical or institutional oversight of the biofuels industry in South Africa and how so?

APPENDIX C: RURAL DEVELOPMENT IN SOUTH AFRICA: A BRIEF REVIEW

As highlighted in Appendix A, the World Bank suggests three emerging themes are important in deciding on biofuels, namely: the social, economic and environmental. Discussing these three broad categories is important, as policymakers have had to deal with such issues in their formulations, but an extensive focus is impractical here.[1] Rather, I will focus on one broad category (rural development), which itself incorporates elements of the social, environmental and economic, and locate such an aspiration within the South African context. Rural development has been especially provocative as a basis for support in the South African case—it is perhaps the most alluring of the 'win-win' narratives for developing countries—and thus, I will examine the South African rural-development context in which various types of biofuels projects are being proposed (see Chapter 4). Two issues immediately come to the fore: the food-versus-fuel debate and considering the political economy/ecology of biofuels. Both are discussed in varying degrees with food security being a common thread throughout the discussion. Beyond an instrumental level, the social (political) construction of the rural economy, for example in the form of two economies, sets out broad categorisations that direct certain strategies in response; as do international discourses and counterpart win-win narratives

[1] Beyond political aspirations and specific government sustainability frameworks that may be put in place, there exists a range voluntary sustainability frameworks and certifications (the Roundtable on Sustainable Biofuels (2010) with its twelve principles is one example), which allow for more instrumental procedures to ensure negative impacts are minimized and benefits maximized (Scarlat & Dallemand 2011). As the use of such criteria is voluntary and may sometimes contradict political and economic aspirations, their ultimate efficacy cannot be taken as automatic. There are a range of other issues that might also make implementing sustainability frameworks only partial, such as, lacking government capacity, an underlying conceptual blurring and uncertainty in moving from abstract prescriptions to impacts on the ground (neither the concepts of sustainability nor the impacts on the ground are clear cut!), and that frameworks are largely established to make improvements not necessarily exclude damages. In an approach similar to my thesis, Fortin (2011) has proposed examining how dimensions of power and the incorporation of the biofuels industry in such processes produces specific 'knowledges' in the face of highly contested narratives.

SOUTH AFRICA AS BIOFUELS FRONTIER: THE POTENTIAL FOR RURAL DEVELOPMENT

Very few countries, if any, have been able to sustain a rapid transition out of poverty without raising productivity in its agricultural sector. To do so, there needs to be a successful structural transformation in which higher productivity provides food, labour and even savings to the process of urbanisation and industrialisation (see James 1956; Trimmer 2005). There are strong, direct relationships between agricultural productivity, hunger and poverty (Von Braun *et al.* 2004). From a food security perspective, as this will be important later, it should be noted that South Africa is not in any immediate danger of a (Malthusian or availability) famine (du Toit & Ziervogel 2004).[2] A dramatic consideration of biofuel production is that, if the production of biofuels is big enough to effect climate change, one if its greatest supposed environmental benefits, it will be big enough to cause global starvation (Monbiot 2004). It should be stressed that there are certainly benefits to producing biofuels but these come with a number of caveats and as mentioned will depend on a variety of contextual factors and contingencies in rural areas (e.g. White & Dasgupta 2010). The idea of competition between food and fuel, to which Monbiot was referring above, is one of the poignant issues when considering the rural development potential of biofuels production. As it has been a major subject of debate in South Africa, I will discuss it first before moving onto general theoretical and country-specific aspects of rural development.

Countervailing Development(s): The Food-Fuel-Feed Nexus or Food-Versus-Fuel?

The production of biofuel from feedstock has had apparently radical effects on the global food supply. Powerful and emotive allegories have been used to depict such disruptions. "The grain required to fill a tank of a sports utility vehicle with ethanol (240kg of maize produces 100litres of ethanol) could feed one person for a year" the world development report of 2008 (World Bank 2007, p.71) proclaimed. (A Google search of this quote indicates its discursive power.) Globally, the most serious

[2] However, in 2007 South Africa recorded a rare net deficit in maize production (National Treasury 2008).

concerns about biofuel expansion therefore focus on the potential impact on global food prices and thereby poverty (Eide 2008; The Royal Society 2008). Most pervasive was the massive food price increases, beginning circa 2005/2006, for which biofuels were considered by some to be the major cause (e.g. Mitchell 2008; Pfuderer *et al.* 2009). From a global perspective, the argument is relatively simple (or too easily simplified) and food security—at this level considered a supply and demand issue—is dependent only on aggregate availability. Much of the early debate for biofuels began and ended at this juncture but as food security researchers have shown, the challenge differs considerably at a national and sub-national level, and is far more complex (Ruysenaar 2011b). (This is also not to suggest that the global situation is thoroughly understood, as significant debate persists around the emerging structure of a global food-feed-fuels market (Banerjee, 2011 provides an economic perspective; Koning and Mol, 2009 a governance one).)

Considering the definition of food security itself can highlight the complex interaction of biofuels with the agro-food system. The National Department of Agriculture (2002, p.15; see also World Bank 1986) in South Africa defines food security as:

> [p]hysical, social, and economic access to sufficient, safe, and nutritious food by all South Africans at all times to meet their dietary and food preferences for an active and healthy life.

Implied in this definition is that there are three main tenets to food security; ensuring food is *available*, that it can be *accessed* when it is available, and that when it is accessible it is *utilised* in ways that assure a nutritious diet. Cutting across each of these are issues such as '*risk*' (Webb & Rogers 2003, p.5) and '*stability*'(Bilinsky & Swindale 2005; Food Security Working Group 1997), which affect the surety of each component. Although previous paradigm shifts have enriched our understanding of food security (see Maxwell 2001; Maxwell & Slater 2003), an important and more recent addition is considering food security as the outcome of a complex, adaptive food system (Elphinstone 2011; Ericksen *et al.* 2009; Ericksen 2008; Ingram 2011). This is important as it moves from somewhat normative frameworks of what is required, to reflecting on what actually happens (with the ultimate goal being to combine the two). Although food security is the desired outcome of the agro-food system, there are others, and the system itself has no moral compass to ensure that

the most vulnerable and marginalised are safeguarded. Regardless, the components of food security provide important clues as to how biofuels might make an impact. As I have argued elsewhere (Ruysenaar 2011b, p.130):

> [i]n a simplified picture, the new food-fuel nexus has been characterized by two things: a depletion of what food is available (not necessarily in a neo-Malthusian sense but more in a speculative market sense), and a subsequent rise in food prices, which has eroded accessibility. However, the picture is more complicated than simply assuming the accessibility and availability arguments. The distinction between them is also arbitrary; biofuels do not simply create a trade-off between one and the other. Essentially the price fluctuations are symptomatic of the interconnected and market basis of the global agro-food system.

Despite the complexity acknowledged by food security scholars, popular discourses and narratives remain transfixed on simplified perspectives and a production bias, with little emphasis on linkages between increasingly complex, concentrated and fragile food markets, feed markets, and energy markets; the latter now more intimately connected to the former as a cost driver—by supplying fossil fuels—and consumer—by demanding biofuels.

Although sub-Saharan African countries are "feeling the pinch from rising food prices, biofuel production at regional and national levels need not diminish regional food security" according to Von Maltitz *et al.* (2009, p. 10; see also Diaz-Chavez *et al.*, 2010; Marshall, 2008). The global, regional or national imperatives, depending on their approaches, may underplay the very nature of food security (an access issue) with profound impacts possible at the local level. Additionally, if biofuels are to be developed it could significantly undermine food sovereignty (Mayet 2008). Complicating the issues further, the FAO (2008) states that while higher agricultural prices could revitalise the role of agriculture as an engine of economic growth over the medium- to long-term, urban residents and the large number of net food buyers in rural areas are likely to be negatively affected, with the poorest households the most affected. The policy question to be answered here is to whom the benefits should go and how this might be achieved.

A useful concept to consider the food security situation is to consider the food 'equation'.[3] Food availability and access (supply and demand) are the two sides of the food (hunger) equation. The first premise is that increasing food production, storage and trade can ensure food availability, but this will not automatically ensure that all people have enough to eat and end hunger. The second premise is that because poverty is central to the cause of hunger and malnutrition, special efforts are needed to help increase the access and entitlement to food (Van Zyl & Kirsten 1992). Specialists on both sides of the equation generally propose partial solutions to the complex issue. A large-scale biofuels strategy should not overlook the lessons learned from previous strategies that were aimed at market-related and production-biased development and the impact they had on food security. For example, structural adjustment and accompanying policies aimed at improving economic performance were based on several implicit assumptions about how African food systems operate (Weber *et al.* 1988). As illustrated by the 'food-price dilemma' it is obvious that such approaches do not work as they neglect to include the second premise of the food equation. This again insists that local contexts have to be understood and complexities unravelled. Only through this kind of analysis can we begin to identify pathways for a fair distribution of the benefits.

Biofuels and Constructing Rural Development

The issue of food security as described above begins to illustrate how biofuel production is intricately linked to other complex socio-political and ecological systems, in ways that are still being figured out. What is important then, is to grasp the way in which technological shifts, biofuels especially, are subject to and influence existing political economies or rather political ecologies in different contexts.

Ambitions of rural development, drawing on the mantra of an unlimited market for biofuels, have been prevalent within the biofuels lexicon for some time. Prophetically, by increasing market opportunities and therefore increasing

[3] Referring to this as an equation is perhaps a misnomer as there is actually no direct equivalence between accessibility and availability, however, as it has informed food security thinking it is useful to dwell upon; if only for illustration.

employment or income, rural areas (and food security) will be enhanced. Some consider this a 'paradigm shift' associated with biofuels that would transform hitherto neglected rural economies in the 'developing' (and developed) world, stabilising commodity (and thus food) prices in the long run (Peskett *et al.* 2007 provide a useful overview). The reality of such benefits are disputed or at least highly contextual and differ between regions (German *et al.* 2011). Similar to many blueprint development narratives in the past, the beauty of biofuels is the ease with which they confront multiple challenges including rural 'under'-development. The popular assumption insists that such under-development is well understood, suffering only the absence of suitable 'agrarian reforms'; or what Scoones *et al.* (2005) critique as 'quick fix' approaches. They aptly remind us, however, that

> ...there is of course no magic bullet for the problems of African agriculture: no technical, market, institutional or policy fix (*ibid.*, p.11).

The main problem with the 'biofuels equals rural-development' narrative is that it is dominated by a *laissez-faire* approach to agrarian reform in which the so-called 'quick-fixes', commensurate with current hegemonic liberalization and modernization discourses, are relied upon. However, the efficacy, equity, and sustainability of market-based and industrial agrarian reforms are questionable; markets also fail (see Jacobs 2009).[4] Even recent proposals to transform agro-food commodity chain, based on the World Bank's (2007) vision of 'Making Agro-Food Markets Work for the Poor', neglects that such transformation affects the poor in complex ways that differ from neo-classical textbook stories. For example, as we saw with the food equation above, incorporating food security concerns more explicitly into agricultural marketing policies is vital to overcome the contradiction in the modern food system in which those working in the agro-food sector tend to experience higher levels of food insecurity and are more vulnerable when markets fail. Professor Johan Kirsten has described the South African case as one of 'hunger next to the granary' (see Van Zyl & Kirsten 1992).

[4] The debate is much wider than this and while state failures actually spurred on free-market-based approaches, it is more realistic that the solutions reside somewhere between the two (Dorward *et al.* 2005).

The type of agriculture being perpetuated for biofuels production serves as a useful example here, by falling largely into 'agrofuels' (borrowing from Via Campesina) or 'ergronomic' projects (borrowing from Charles *et al.* 2007). Agricultural reform in this instance is a modernising campaign based largely on capital-intensive mechanization and industrial inputs, sometimes framed within the context of green revolution. However, evidence suggests such large-scale industrial enterprises and the pattern of biofuels production and consumption are unlikely to benefit developing countries and especially the rural poor within those countries (e.g. Ariza-Montobbio *et al.* 2010; Dauvergne & Neville 2010; e.g. Matondi *et al.* 2010; Richardson 2010; e.g. Wolde-Georgis & Glantz 2009; Woods 2006). These are especially problematic in the form of large-scale land acquisitions, or in the more politically charged term 'land grabs' (mostly foreign acquisitions with production based on industrial-based mono-cropping farming for export), not just for biofuels production but increasingly for food as well. Others argue that, although the potential for harm exists, foreign investment into agriculture has its benefits and need not be an exercise in exploitation (Cotula *et al.* 2008 provide a useful outline).

If anything, concern about biofuels production highlights "the highly questionable sustainability of most of modern agriculture" (Moore 2008, p.6) (see also the critical appraisal by the International Assessment of Agricultural Knowledge, Science and Technology for Development (2009)).[5] Any calls, for example, for a 'green revolution' (Conway 1998; Eicher *et al.* 2006; Mosley 2002; Sanchez *et al.* 2009) should also consider the (infra)structural, agro-ecological, climatic and geomorphologic constraints that are particularly common to agriculture in Africa, as well as dynamic social, economic, and political diversity at all levels. For one, political-economy factors nearly always conspire to return weaker players to their marginalised positions regardless of any new technological advantage (Kent 1999). Similarly, benefits (essentially profits but food security as well) do not increase

[5] For example, "there is growing consensus that the current model of agricultural knowledge, science and technology (AKST) requires revision. Business as usual is no longer an option". This is not to deny the important role science and technology plays but more so acknowledging caution in its application.

proportionately with increasing yields (Leisinger 1995 cited in Kent 1999; e.g. Richardson 2010).[6]

As one way of contextualising the above, White and Dasgupta (2010) provide an informative perspective of biofuels and rural development by drawing on political economy analyses of non-food agricultural commodity markets. They conclude that it is not so much biofuels (as a commodity crop) but the manner in which these crops are grown, under which forms of ownership and labour regimes and in what kinds of commodity chains. Following from Henry Bernstein's (1992, p.24) dexterous framework that asks: 'Who owns what?' 'Who does what?' 'Who gets what?' and 'What do they do with it?' they narrow the enquiry further to 'where the land will come from', 'how will production be organized' and 'for whose benefit'? The simplicity of these questions is attractive but answering them, whilst giving specific and adequate attention to, for example, food security can be a complex undertaking. The overall emphasis here overlaps with emphasising and understanding rural heterogeneity, which 'post-Washington Consensus' thinking embodies (Maxwell & Ashley 2001; Scoones *et al.* 2005). While underpinned by the continued importance of the agricultural sector as a driver of economic well-being and rural development, there are multiple livelihood strategies and circumstances of considerable flux - driven through forces such as globalization, deagrarianization (Bryceson 1996) or legislated agrarian labour reforms (Aliber *et al.* 2009; Greenberg 2010) amongst others.

There is an equally important political-ecology critique that requires some discussion, as it directly contests the validity of claims made for rural development. As an example, Ariza-Montobbio *et al.* (2010) draw on two main theses of the political-economy approach: Foucaultian 'knowledge-power' (that is power being

[6] Whereas 'green revolution' technologies present technical fixes that need to be adapted to specific circumstances, regulating or 'fixing' food commodity prices (through increased demand in the case of biofuels) have come to represent common practices as policy 'fixes'. However, one again has to raise the food equation, and the associated conundrum of the 'food-price dilemma' in which rising commodity prices benefit net producers of food but may harm net buyers (Ravallion 1989; Sah & Stiglitz 1992; Timmer *et al.* 1983). It is generally assumed that rural people are net growers of food so they are most likely to benefit from increased prices. This, however, bears little resemblance to what happens in reality (see Van Zyl and Kirsten, 1992 for a South African perspective; Weber *et al*., 1988 for an African one).

exerted through the realm of ideas and discourses) and 'marginalisation'. The latter refers indirectly to social and environmental degradation due to production at the margin and more directly to socially marginalised groups, producing and living in marginal ecosystems (Blaikie and Brookfield 1987). Using these two lenses, Ariza-Montobbio *et al.* (2010) then unpack the social construction of pro-wasteland and pro-poor discourses by, for example, examining how 'wasteland' differs in meaning but generally carries a colonial economic connotation while current technical meanings are devoid of any recognition of the 'value-ladeness' of the term. This creates space for single-sided interventions, which are then made more appealing based on equally de-contextualised representations of 'pro-poor' interventions[7] (see also Pradhan and Ruysenaar, *forthcoming*).

The above discussion highlights that contexts and their descriptive discourses matter, in that they have a profound effect on the technical solutions offered in response to apparent manifest challenges. In the next section, I will drill down into the South African case and, as I have unpacked some of the proposed projects in Chapter 4, I will describe further the agricultural landscape, challenges of change and the political economy of agriculture that these projects will need to incorporate or encounter. The point here is that there is an important contextual follow on from the 'second economy' literature in previous chapters, which allows the construction of the second economy to be compared to those outlined by political ecologists in other countries (e.g. Ariza-Montobbio *et al.* 2010), and with ramifications for the policy process described in the main thesis.

SOUTH AFRICA'S RURAL LANDSCAPES: MOVING BEYOND METAPHORS

> *Our people are bound up with the future of the land, our water, our sources of energy, and the air we breathe* (Nelson Mandela, 1995).

[7] The pro-poor discourse is based on three main arguments, the short maturation period of *jatropha*, its 'low-input crop' characteristics, and the associated promotion of 'small-scale decentralised energy production'. Narratives of less water, fertilizers, and labour being required and *jatropha's* convenient harvest season (Cf. Kumar-Biswas *et al*., 2010) further solidify its position as pro-poor crop, especially for small or marginal farmers and the landless. The research findings of Ariza-Montobbio *et al.* (2010) undermines such optimism.

First and foremost, it should be stressed that, from an agricultural perspective, South Africa is not particularly blessed with an overwhelmingly fecund natural endowment: it is a water-stressed, semi-arid country receiving on average 497mm but being prone to severe droughts[8] (Nieuwoudt & Groenewald 2003, p.21), although with pockets of fertile soils and, areas of well-connected rural infrastructure. Variable climate and soil combinations leave only twelve per cent of the country suitable for rain-fed crops and only three per cent considered truly fertile or high-potential land (Goldblatt 2010, p.2). Despite significant environmental constraints, South African farmers regularly produce surpluses for export markets over and above satisfying local needs. Indeed, "physical output increased from around 18million metric tonnes in 1975 to 28million metric tonnes in 2006 with an increase in agriculture's total factor productivity (Vink & Van Rooyen 2009, p.5). Animal production dominates this output (c. 43%) with field crops (c. 30%) and horticulture (c. 27%) following respectively (*ibid.*, p.6). By value maize, Sugarcane, wheat, hay, sunflower seed, tobacco and groundnuts are the top field crops, whilst slaughtered fowls, slaughtered cattle and calves, fresh milk, eggs, and slaughtered sheep and goats were the top animal products (Pieterse & van Wyk 2005 citing Nyes and Meyer, 2001).

A variety of factors— increasing trade liberalisation and international competition, market deregulation and democratising shifts—affect the agriculture sector, which translates into difficulties in developing rural areas in general (De Klerk *et al.* 2004; Kirsten *et al.* 1998; Nieuwoudt & Groenewald 2003; Pieterse & van Wyk 2005; Vink & Kirsten 2003). Much of these shifts have accompanied new legislation and policies around trade; marketing and deregulation; land and resource management; labour policy; farmer support and extension services; agricultural finance; agricultural

[8] South African agriculture is influenced by weather occurrences more than any other factor. As Vink and Van Rooyen (2009, p.4) remind us "there has been a severe country-wide drought in at least one year of each of the preceding decades (the most severe being in 1966, between 1982 and 1984, and from 1992 to 1993). The period from 1994 to 2008 is an exception to this trend, as there has not been a country-wide drought for more than a decade". There have still been localised droughts and there are concerns that maize farmers consider drought more of an aberration than a given and therefore do not adequately plan around it (Marcus *et al.* 1996). Climate change predictions are that rainfall in South Africa will become more erratic and droughts more likely, putting further pressure on any (surplus) production. Significant reductions in maize production in southern Africa have been projected (Jones & Thornton 2003) with South Africa suffering the highest gross loss of 871,500 tons of maize in 2055. Although maize (−28.5%) and wheat (−15.7%) are the two crops that are hardest hit in southern Africa.

research and technology development and Black Economic Empowerment (AgriBEE) (Vink & Van Rooyen 2009 provide a succinct overview). Others, such as The World Future Society of South Africa suggest five continuing concerns for the future: energy; climate change; immigration; employment and ethical values (Breytenbach, 2010; see also BFAP, 2010). To this list, Prof Breytenbach (2010) adds the unpredictable political future, whilst advocating agribusinesses greater involvement in assisting and solving on-going schisms in the agro-economy and policy thereof. Each of these is important, however, following the logic of win-win narratives, in this section I will focus on employment and the political economy of agricultural sector in general.

The agriculture sector in South Africa is characterised by a pronounced duality resulting from decades of exclusionary government policy under apartheid, inspired by the political and economic philosophy of White domination and not by genuine economies of scale (Pieterse & van Wyk 2005). "The evolution of South African agriculture during the twentieth century witnessed three major trends" (Vink *et al.* 2000, p.44). First, the development of the agricultural sector was initially characterised by strategies aimed at territorial segregation of white and black farmers. In the second phase, considerable state support[9] contributed heavily to commercialisation of White agriculture and the formation of large-scale farms utilising (mostly black) wage labour (Vink & Kirsten 2003). Because of this restructuring of the sector, the majority of the black population were unable to afford food, due to artificially low wages, while also being unable to produce food due to forced removals (Greenberg 2003). At the same time, the significant state support did not allow for an efficient sector. South Africa's agricultural marketing system proved to be financially, economically and politically unsustainable (Bayley, 2003).

The third trend was a reversal of the "distortionary policies up till the 1980s, brought about by external and internal pressures on the sector" (Vink *et al.* 2000, p.44). The changes have consisted of trade reforms, a revision of policy toward economic liberalisation, extensions of farm worker rights, legal frameworks and programmes

[9] Consequences included distortions in land and labour markets, input and output markets, infrastructure, agricultural credit and services, as well as the creation of large-scale white farms (World Bank, 1994).

for land reform, and redressing inequalities. While showing significant signs of change and greater efficiency, the sector still displays a bias towards capital intensity and commercial agriculture dominated by White farmers, with limited changes in terms of improved equality and living conditions of the rural poor (Vink *et al*. 2000; Van Zyl *et al*. 2001).[10] Greenberg (2003; see also Jacobs 2009) argues that continued agricultural restructuring programmes, initiated by the apartheid government, have skewed the concentration of resources in the agricultural and agri-processing industries towards that segment of the population with relatively greater wealth and resources at their disposal (see Bernstein 1996 for a discussion of maize).[11] As Van Zyl *et al.* (2001, p.725), suggest, subsequent to the disbanding of the GNU, important policy initiatives "included land reform, institutional restructuring in the public sector and the promulgation of new legislation and labour market policy"; the major purposes to "correct the injustices of past policy" and make the sector less capital-intensive and more internationally competitive.

The agricultural sector, however, remains important. It represents a central, strategic way in which to empower economically vulnerable groups. Given the historical context, the situation now is that the agricultural sector must be de-racialised while maintaining a national priority towards food security or self-sufficiency (at least at national level). At the same time, there is a focus on poverty alleviation and food accessibility necessitating a revision of agricultural policy, though the link between these remains poorly conceptualised (Nieuwoudt & Groenewald 2003) and extremely tricky; the biofuels narratives of rural development appears to provide a simple solution to the situation through proposals of significant employment potential (Chapter 1, 4 & 5).

[10] Small farmers as a group have not benefited from reform processes (Pieterse and Van Wyk, 2005).

[11] A similar situation has been shown in the urban context in which Tomlinson (2002, p.380) suggests "[e]conomic and social exclusion, deliberately fostered under apartheid, is being accentuated in the post apartheid era. The *Urban Development Framework*, self-evidently, proved illusory." In housing policy, definitions of delivery are adapted to meet exiting outputs (subsidies provided) rather than outcomes (houses actually built) and development criteria are neglected, proposing developments away from job opportunities, schools, medical services, and shops (i.e. marginalized) to decrease the risk of political opposition, associated legal action and benefit from cheaper prices.

Of crucial importance then, is employment within the agricultural sector itself. Commercial agriculture represented almost one-third of formal sector employment in rural areas in 1998. Despite this, the regular employment on farms has declined by about twenty per cent during the 1990s (Aliber 2003). Data presented in Van Zyl *et al.* (2001, p.731) show that the agriculture sector shed approximately 200,000 regular employees between 1985 and 1996, and a further 200,000 casual and seasonal workers. In a presentation by the National Department of Agriculture, Fisheries and Forestry, formal agriculture has made a decreasing contribution to national employment dropping from 11% in 2000 to 5% in 2010 (Ngqangani 2010). This suggests not only an absolute sectoral decline within agriculture over the long-term but also a declining total employment contribution to the national economy (see also DAFF 2010). In addition to declining employment in the sector, a second major trend is an increasing 'casualisation' and expansion of non-permanent jobs. Furthermore, increasingly draconian labour laws have had adverse effects. Former farm workers are particularly susceptible to social exclusion, especially when evicted from the farms where they used to reside and work. Many retrenched farm workers were born and raised on the farms from which they were eventually ejected; thus they have no 'roots' elsewhere, to which they can return (Bekker *et al*. 1992, in Aliber, 2003).

From a regional perspective (including South Africa and its neighbours), it is important to note two things. First, there has been a general decline in agricultural investment within the SADC[12] since the 1980s, although the food crisis beginning 2006 has accelerated a reversal in official development assistance, which has begun to increase (Cheru 1992; World Bank & DFID 2011). South Africa, to some degree, has also neglected its agricultural sector in recent decades, although there are various distinctions to be drawn between the types of reforms that have taken place and their

[12] This is not only a SADC phenomenon but one widespread. The World Development Report 2008 (World Bank 2007) propose three main reasons for underinvestment in Agricultural Research and Development despite the well-documented high rate of returns. The World Bank (2007, pp.166–167) suggests:

"First, the political economy of public expenditure decisions tends to emphasize short-term payoffs and subsidies that are 'politically visible' while agricultural R&D investments are both long term and risky. Moreover, in agriculture-based countries, the political power of farmers is low anyhow. Second, trade distortions and national policies that reduce incentives to farmers in developing countries are a disincentive to both public and private investment in R&D. Third, because the benefits of much public R&D spill over to other countries, it might not make much economic sense for small countries to spend their scarce resources on agricultural science, on their own behalf; many nations have been free-riding on the efforts of a few others".

cost-benefits (Nieuwoudt & Groenewald 2003). Liebenberg *et al.* (2011, p.23; see also Vink & Van Rooyen 2009) suggest that:

> [t]he amount of real funding for public agricultural R&D failed to grow since 1992; the intensity of investment in agricultural R&D also stagnated; and the country lost a substantial number of well-trained and experienced agricultural scientists.

In the 2013 budget speech, Minister Pravhin Gordan failed to even mention agriculture, a glaring omission and neglect for an increasingly important sector (Worrall 2013).

Second, and more important, is that regardless of their ideological orientation, most governments have failed to recognise the importance of small-scale farmers, particularly women, when setting their development priorities (Cheru, 1992). The South African case is one in which there has been an institutionally and calculated demise of the peasantry through a barrage of administrative and punitive measures, which transformed them into surplus labour for the mines (Marais 2011). It is also worth mentioning that, historically, the growth of commercial agriculture lead to many Afrikaners being pushed off the land creating a poor (urban) White problem as they couldn't compete with immigrant Europeans (*ibid*). From the 19th century onwards, the policies of successive White governments sought to create wealth for the small population of White commercial farmers by destroying independent African farming communities (Moeti 2007).

Although recognised as important, there has until recently being only limited investigation into employment potentials of small-scale agriculture. There are, for example no credible, long-term data on a national scale that establishes trends in the subsistence / small-scale sector (Aliber *et al.* 2006; Jacobs 2009) although there are case studies of land under-utilisation in former Bantustans, as well as anecdotal information that agriculture in these areas is undergoing a decline. The Labour Force Surveys of 2002 and 2003 provide some insights into transitions into and out of agriculture (Aliber *et al.* 2009). Half of respondents to these surveys did engage in agriculture in one or other period (February 2002 or March 2003). Only eighteen per cent engaged in farming in both periods, indicating a remarkable fluidity in and out of farming. This is marginally more than those who farmed in the first period and not

in the second (16%), and those who did not farm in the first period but did farm in the second period (14%).

The implication is either that farming is very much a residual activity, or that people experience fluctuations from year-to-year in having the means to engage in agriculture. The limitations of this research should not overlook a comparatively rich literature reviewing (especially from an agricultural economist perspective) the successes and challenges to small-scale farmers in the country (Ortmann and King, 2010; for an extensive summary see Vink, 2001). Despite widespread reforms since the 1990s yielding a far more efficient agricultural sector, there have been winners and losers, with small-scale farmers seeing very few if any benefits (Van Zyl *et al.* 2001). If anything the market-based, neoclassical approaches of 'getting the price right' affects poor and non-poor social groups in complex ways (Jacobs 2009, p.2). As an example, he suggests of the Marketing of Agricultural Products Act of 1996, "small-scale farmers seem to be equivalent to other actors along the agricultural marketing chain. Whilst this notion of equal treatment is commendable, the 'level playing field' decreed in policy does not immediately mirror what actually existed in the real world" (2009, p.11).

Despite the evident diversification out of agriculture, rural production remains an important component of many rural livelihoods in South Africa. "African rural dwellers …deeply value the pursuit of farming…food self-provisioning is gaining in importance against a backdrop of food inflation and proliferating cash needs" (Bryceson 2000, p.5). Participation in "small-plot agriculture" is also highly gendered, with women taking major responsibility for it as one aspect of a multiple livelihood strategy. Furthermore, Peter Hazell (2001) suggests that to ensure pro-poor development, high priority has to be given to small-scale farmers through broad-based agricultural development. There is a challenge here, one that agricultural economists have cautioned before. Professor Nick Vink (2001, p.178), for example, suggests:

> …agricultural economists have failed to distinguish between small farmers in the former homeland areas and the desirability of the creation of small family farms in the commercial farming areas. More particularly, we as a profession still use the rhetoric of the role of agriculture in development in a modernised economy. This confusion is, of course, compounded by the

fact that the land reform programme has thus far succeeded only in duplicating the conditions in the former homelands, where it is still all but impossible to farm commercially. The result is that agricultural economists stand accused, along with others, of trying to recreate a past that never existed.

APPENDIX D: THE CRADOCK CASE-STUDY

Whereas there has been a so-called rise and demise[1] of biofuels, it should be remembered that individual projects themselves have histories and Cradock is especially peculiar in this regard. As much as I have insisted that there has been a project stream involved in the policymaking processes, so too are there multiple dimensions and intricate histories and plans for sugar beet in Cradock, which extend well beyond the latest plans for bioethanol. The main focus in Chapter 4, was to show that, as the governments' vanguard project in the Eastern Cape, the Cradock sugar beet project is an element within the wider biofuels assemblage but also as a type of boundary organisation or contact zone in which implementation (and more so the project supporters) are fulfilling not only practical aspects of implementation but renegotiating the very foundations of the strategy. The project is therefore part of the policy process (an on-going one), or at least is an integral part of the policy system and associated policy community. In this Appendix, I will provide some detail of the project's history and the networks involved in its own development.

Arriving at Cradock, a far wider scope for the focussed policy research was discovered.[2] While discussions with policymakers at national level had raised numerous issues around Cradock, especially continuing delays in the project's implementation due to challenges in the strategy, no one mentioned either the historical aspects of the project, or the local contestation that surrounded it. I find these important as, if policies are the outcome of co-production and acts of meaning making, local contestation is surely a means through which certain 'meanings' and imaginaries are articulated and reinforced, potentially being where they are established. That is to say, the policy process should not be dislocated from the more

[1] Considering the 2007 Strategy as the final decision is *ahistorical* and fatalistic. Although many projects never materialised, there has been on-going reworking and negotiating of the final decisions taken with the 'Big Four' have been continuing to lobby with the Biofuels Task Team and have managed to, along with other factors, sway decisions and shift the level of support provided in 'the policy'.

[2] Prior to this, there was an earlier aim to do an impact assessment of some of the projects in terms of 'development' benefits. The objective was to identify how the benefits reflected the original aspirations of the strategy. Since there were no such projects actually in production this was not a possibility and instead I pursued looking at how the remaining projects and actors within the biofuels assemblage were continuing to interact (or ignore) policy makers.

specific processes, struggles, and competing interests that occur at the project level. They are not simply attributes of the project but interdependent and mutually constitutive within policies, even though they maintain their own history and specificities.

CRADOCK IN CONTEXT

A recent newspaper article entitled 'Biofuel Plant Backfires on Community' states:

> [i]t started out with a bang, but land deals went sour and farms lie barren as the project stalls (Kings 2012).

The newspaper report goes on to discuss the paranoia of local farmers to openly talk about the project due to their vested interests; the hype of the project as the new 'big thing' in 2007 and the potential of the soils to produce oversized sugar beets. The report also discusses the 'source of contention' being the land reform project—a core estate of 6,000ha—that is supposed to supply feedstock to the plant but has been handled poorly by the Department of Land Affairs. The department, which changed the valuations "destroyed any goodwill it had" with the farmers according to one respondent cited in the article. Those farms that have been bought are in disrepair. Finally, the report mentions the Industrial Development Corporation (IDC) and the continued delays in setting up the plant. The IDC, who essentially own the Cradock project, argue that remaining issues with the strategy are the key concern. The report concludes suggesting that a biofuels revolution 'lays in waiting' (*sic*) with Cradock residents left angered.

As a newspaper article, the report necessarily lacks detail but situates the focus of this chapter. The importance of the Cradock case study to this thesis can already be noted within the above article, in that the IDC are closely entwined in the policymaking processes; at this stage working towards resolving the remaining 'issues'. However, Cradock, with its land reform programme and local contestation, is important as a case study in its own right. Little regard has been given to how technology such as biofuels has encountered social and political forces constraining and transforming its final use. An adequate understanding of the coalition of interests seeking to establish sugar beet as a viable commodity (and the various contingencies

surrounding them), remains largely undocumented in both popular and policy literature and has escaped any scholarly attention thus far.

Power is Sweet – Sugar Beet Production in the Great Fish River Valley

One does not expect to learn that the sugar beets grown in the seemingly infecund, semi-arid landscapes of the Karoo are amongst the best in the world. 'Best' meaning not only that they outsize their global competitors but also have superior concentrations of sucrose and can be produced at competitive prices.

As a low-rainfall area, commercial farming in the Karoo requires irrigation; however, the major river systems in the area are saline, with limited ground water available from the underlying minor aquifer (Vivier *et al.* 2009). In response, like many farming regions in South Africa, the Great Fish River Valley (GRFV) has benefited[3] from water transfer schemes, which have allowed for sustained commercial agriculture production (Figure 8). Sourcing water from the Gariep Dam, a tunnel 82,8 km long—the longest continuous enclosed aqueduct in the southern hemisphere—supplies water to the Great Fish River and Sundays River(Department of Water Affairs 2012).[4] Earlier irrigation dams and canals transformed the landscape into a 'Lucerne Paradise' in the 1920s (Eastern Cape Herald cited in Beinart 2008) with orange and apricot plantations proliferating in the predominantly English and aptly named Golden Valley. As William Beinart recounts of the period, after the three major dams—Grassridge, Lake Mentz and Lake Arthur—were built,

[3] Benefit here only refers to increased water availability – there has been ecological damage associated with such transfer schemes that should not be discounted (Bohensky *et al.* 2004), as well as potentially higher rates of mineralisation (Hall & Görgens 1978).

[4] This tunnel system is part of a longer history of water transfer schemes and irrigation in the area. As William Beinart (2008, pp.188–192) discusses, water infrastructure such as dams and irrigation canals were built to sustain increasingly profitable citrus and deciduous fruit farming in the Fish and Sunday's River Valleys. In the 1920s a major dam (formerly Lake Mentz now Darlington Dam) was built to supply citrus plantations—involving author of 'Jock of the Bushveld' Percy Fitzpatrick—in the Sunday's River Valley. Grassridge Dam on the Groot Brak (*lit.* Great Salt) River and Lake Arthur near Cradock, further allowed diversification from stock farming into deciduous fruits—apricots in particular—within the Fish River Valley. Although diversifying into smaller crop-based farms, Lucerne production remained dominant and the new irrigations farmers—mostly of English descent such as the Collets and the Barbers—remained closely integrated with the livestock economy. An even earlier history shows the strategic importance (and struggle for control) over the Fish River Valley. Prior to Europeans arriving, the Xhosa displaced local Bushman in order to heard cattle, while frontier wars fought between European settlers and the Xhosa were also in large part to secure water supplies.

the massive injection of state capital into the Karoo facilitated intensive commercial production of citrus, apricots and Lucerne but "there was never enough water to unlock the supposed riches of the Karoo soil" (Beinart 2008, p.191). Investment into large-scale water works atrophied in the 1930s and 1940s. A drought in the 1950s forced many of the remaining English farmers to leave the area, which, according to Guy Butler (1981), was actually in decline during the 1930s.[5]

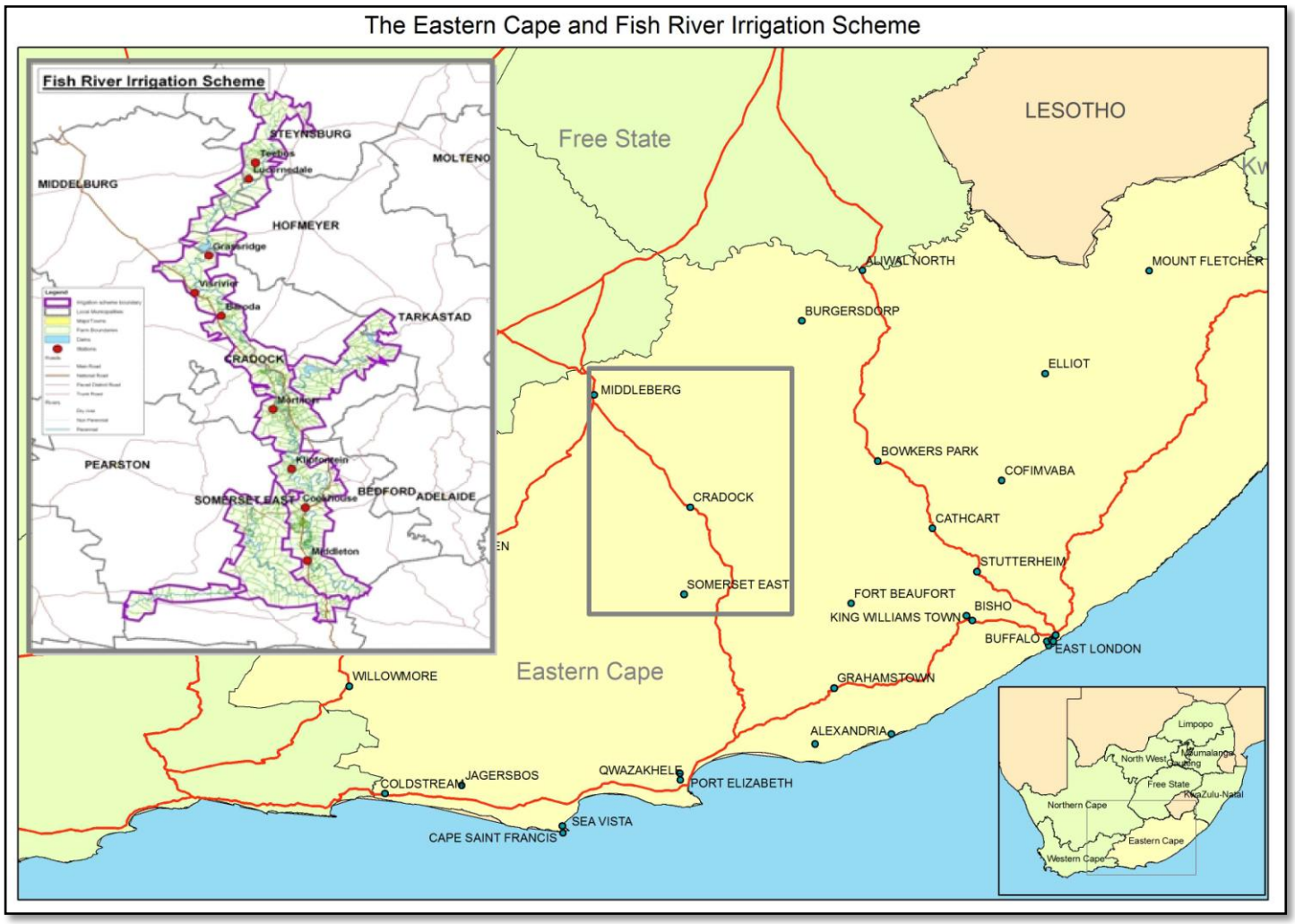


Figure 8: Cradock and surrounds (author's own work; inset copied from Somlotha (2011))

Subsequent to the 1950s drought, the National Party government bought up to 70% of the farmland in the Fish River Valley (Water Research Commission 2004). The land was then reorganised into more economical parcels—85, 60 and 45 hectares in

[5] Droughts and late frosts had constrained fruit production and increasingly saline soils from the water scheme hampered production, however the latter problem may have been localized to specific areas (Hall & Görgens 1978).

the north, central and southern parts of the valley respectively—and redistributed to farmers mostly of Afrikaans descent. After the Gariep Dam and Orange-Fish-River transfer scheme were completed in the 1970s, and with continuing support from government, many of these smaller lots have amalgamated into much larger commercial farms (*ibid.*). However, as one of the local commercial farmers described, despite significant potential irrigable land there has been no crop production taking full advantage of it.

> *[The Great Fish River Valley] is the only irrigation area in this whole country that has not been earmarked for something like grapes, sugarcane or whatever!* (Cradock farmer A, 2011).

In the late 1990s, (if not somewhat earlier) farmers in the Golden Valley area (part of the wider GRFV) were looking for a new crop.[6] The apricot and citrus plantations were in decline or outright failing because of transport costs and progressive salination of the soils (depending who one talks to); the region as a whole was in need of a new commodity with a new market. This was the predicament[7] facing the Eastern Cape Agricultural Cooperative (ECAC), which included Cradock and extensive farming areas of the Eastern Cape Province in its operations. Following from trials by farmers near Maclear to the northeast, Hans Vosloo, a member of the ECAC considered sugar beet as a possible alternative crop and future venture for the Golden Valley. Some successful plantings soon after suggested sugar beet was something the ECAC should indeed pursue. Under the leadership of George Ward, the ECAC subsequently began taking an interest in the potential for sugar beet production in the area. The ECAC then collaborated with the German seed company Klein Wanzlebener Saatzucht (KWS),[8] which specialises in sugar beet. KWS seconded Dr. Volker Fischer to the area, who began formal trials to verify the growing potential for sugar beet and develop hybrid seeds for use in the Great Fish River Valley. In a discussion with Dr Fischer (*Pers. Comm.* 2011), he suggested that over 140 trials were undertaken on approximately 30 or so farms. According to a report on the farmers weekly website (Hendrickse 2007):

---

[6] This section draws heavily from discussions with a former member of the ECAC.

[7] The cooperative would support farmers financially and thus mounting debt and limited productive use of the land meant the ECAC would be keen to find new ways to generate income, becoming weary of limited growth of the agricultural economy in the Valley.

[8] KWS are now known as KWS SAAT AG (official website: http://www.kws.de/ca/fh/thd/).

> Claims of spectacular results achieved by his trial plantings were initially met with widespread scepticism by local farmers. In Europe, the US and Russia—which together account for 80% of world sugar beet production—average yields of 50t/ha are reached, although recent trials in Australia achieved an average yield of 77t/ha, peaking at 100t/ha. But in seven years' of trials in the valley covering different planting and harvesting dates, seed varieties, fertilisers, herbicides and growing lengths, Fischer claimed average yields well in excess of 100t/ha, with high sucrose levels.

The Golden Valley had seemingly found its new crop but still required a market. This prerequisite has not only stifled the current ethanol plant being proposed (see Chapter 4) but its predecessor—a sugar refinery—as well.

Initially, the ECACs plans for the area revolved around sugar production[9] as ethanol had not entered the discussion yet. Seeing value in Volke Fischer's agronomic success with sugar beet, the ECAC established Sugar Beet RSA in 1999, a shell company that would promote further development, secure government backing and draw in private-sector investment. As Hendrickse[10] (2007) reports: A [consortium] involving German and South African investors would begin building a R420 million sugar beet mill in Cradock [in 1998], with completion expected in 2000. Funding would come mainly from the German firms Nord Zucker und Kleinwanzelbener Saatzucht and ACE Agrar Consulting, who would own a 53% stake. The deal was dependent on sourcing 10,500ha of irrigated land—virtually the entire Great Fish River Valley irrigation scheme—but it eventually fell through when too few farmers were willing to commit. In the Executive Summary of the Sugar Beet RSA sugar mill's Bankable Feasibility Study, it is stated that:

> The [initial] project reached an impasse in March 2002 when efforts to recruit beet farmers in sufficient numbers to sustain the proposed beet sugar project failed. The [Sugar Beet RSA] consortium terminated its support at this stage (Sugar Beet RSA, 2005, p. 1–1).

This synopsis illustrates the early challenges in gaining support from the farmers. Such a failure of support, which seemingly goes against commercial farmers best interests, requires greater scrutiny given the persistent proposals for an ethanol plant

[9] In brief, the project has evolved from a large sugar plant based on over 10,500ha and using existing commercial farmer production, to an alternative sugar mill requiring less feedstock and based on a core estate, and finally into and ethanol plant that, although provisioned to begin operations in 2008 still awaits construction (at the time of writing in 2012).

[10] Henrickse was the media relations person for Sugar Beet RSA at this time.

in Cradock. A related question, or rather part of the answer, lies in why Cradock was the preferred location. What is missing then, in Hendrickse's (2007) description, lies beneath the figures and begins to illustrate local power struggles, interests and processes that have shaped and been reshaped from these early stages up to and including the challenges of the proposed bio-ethanol project. They are also important with regard to links to the policymaking processes, a point to which I shall return to in later discussions and in the main thesis.

Sites of Contention: Piecing Together Broken Promises in the Great Fish River Valley and Getting Farmers to 'Play Nice'

One version of the early history of the Cradock 'debacle' was described to me by a local newspaper editor, which has been roughly substantiated by a range of other respondents in the area. I detail it here not because it is comprehensive but to provide a generalised (constructed) view from members of the community, providing (one version of) 'their' history. 'Hard evidence' is also hard to come by as, as the respondent suggested,

> *it's not all stipulated down in print... because they said I must keep a low profile and you know we in this whole vicinity were in favour of Golden Valley you see* (Local newspaper editor, 2011).

Golden Valley here refers to an area surrounding Somerset East (see Figure 8 above) approximately 100km south of Cradock, where the ECAC originally planned to establish a sugar refinery. It is also where Hans Vosloo had originally begun growing sugar beet. There was excitement brewing in the area because Sugar Beet RSA was going to buy a second-hand plant from Germany and rebuild it in Cookhouse. Cookhouse was also where George Ward wanted the factory as it had access to the railway line and was centrally located but the decision became more complicated.

> *There is also a lot of unemployment in Cradock so they wanted it there, but there is a lot of unemployment in the Middledrift and Fort Beaufort and those areas...there was a hell of a feud about this factory and Cradock wanting the factory* (Local Newspaper editor, 2011).

The decision for Cradock as the preferred location was borne out of negotiations between Sugar Beet RSA and a local commercial farmers group—the Sugar Beet

Growers Association—that was established to interface between the farmers in the area and Sugar Beet RSA. The challenge for Sugar Beet RSA in developing a sugar mill was that it required dedicated feedstock. It was at this stage that Roak Crew began investigating potential sugar beet supply agreements with local commercial farmers. Roak Crew was "*secretary*" to George Ward; another respondent suggested—light heartedly—"*he carried his bags around for him"* (Consultant F, 2012). One major opponent, though stories differ, to Sugar Beet RSA at this point was a Cradock-based farmer named Hilton Collett. In the words of a former Sugar Beet RSA representative, Hilton Collett

> *was dead against this thing. We travelled to his area … to convince those farmers and then he was elected, we also applied a little bit of politics. We said, listen guys, we had a Sugar Beet Growers Association and we said to the farmers listen get Hilton Collett onto this thing because he is quite a bright guy but very conservative and we got him on the board and then they elect[ed] him as the chairman of the Growers Association and that's where the [trouble] started* (Former SBRSA member, 2010).

As farmer support was needed to ensure sufficient feedstock, a contract was drawn up in which commercial farmers would provision a third of their land[11] to grow sugar beet to supply the factory. Before doing so, Hilton Collett had acquired land from the municipality in Cradock. This was despite the ECACs preference for Cookhouse as that is where they owned land (implying automatic share capital).[12] Having the support of the farmers within the Sugar Beet Growers Association, Cradock became the preferred location, but this meant wider support from farmers outside of Cradock (but within the Fish River Valley) began to wither. It was also an initial cause of delays in the project's development, the first of many. When it came time to sign contracts, as Hendrickse (2007) points out, there was not enough interest from the farmers. As a local agricultural supplier in Cradock bemoaned:

> *I have been more optimistic about [the project] ten to fifteen years ago but the thing is dragging and dragging on. So, ja, in one sentence, you must not bullshit the commercial farmer. I am*

[11] Sugar beet has to be grown in rotation of one year in three and cannot be grown consecutively on the same piece of ground due to pathogens building up in the soil, hence not all land can or will be devoted to sugar beet production in any given year.

[12] Further suggestions for locating the project in Cookhouse included better growing potential and larger irrigation areas and its centrality to all the surrounding irrigation areas.

> *not saying they have been bullshitted but you must have a complete structure* (Cradock Farmer B, 2011).

The picture is a little more complicated as clearly the commercial farmers were not a homogenous group all equally in support of the project. Rather, there were many conflicting arrangements being proposed and contested between the interests of the Sugar Beet Growers Association and Sugar Beet RSA. The movement of the plant from Golden Valley to Cradock is clear indication of this. Declining support from farmers worsened when George Ward died in 2002. George Ward had been central to the project and had gained the respect of the majority of the people involved. Following his death, deteriorating relations between some of the commercial farmers and Sugar Beet RSA and the IDC, the project stalled entirely. Commercial farmers were beginning to resent the constant delays and began to withdrawal support on any proposals for sugar beet. Commercial interests such as KWS also then withdrew.

Not having the support of farmers, but with a continuing interest in sugar beet, Sugar Beet RSA secured new support from the Provincial Government to continue with a Bankable Feasibility Study to explore an alternative project, still revolving largely around sugar production but requiring less feedstock (Sugar Beet RSA 2005). The revised approach rested on the idea of less acreage being needed and also sourcing feedstock from former homeland areas within the Eastern Cape; some of the poorest regions in the country. A representative steering committee chaired by Zukile Pityi of the Eastern Cape Department of Agriculture and Land Affairs (ECDALA) was established, which included Sugar Beet RSA (Roak Crew) emerging farmers' representative Lusapo Bengu[13] and the Sugar Beet Growers Association (Hilton Collett). Roak Crewe and Hilton Collett had thus managed to maintain some control of the project but by leveraging support from new arenas, an entirely new branding of the project came to the fore. The involvement of these players was precipitated on narratives of rural development that would resonate with the ECDALA, for example Furness (2004, p.1) suggests:

[13] Muddying the credibility of this steering committee, Lusapo Bengu has been embroiled in allegations of mismanagement and is implicated in financial wrongdoings as secretary of Qamata trust (Hofstätter 2007).

> The empowerment of black farmers and the upliftment of previously-disadvantaged communities are reportedly important elements that will be considered if the sugar beet project is approved.

Similar sound bites (e.g. Hill, 2005) in the media from the project managers and IDC, reiterated the potential for development in the second economy of the Eastern Cape based on this promising new enterprise. (Although widespread benefits are hard to conceive at this point, as sugar beet production would have to be concentrated in the vicinity of the project itself.) At this stage then, the core estate (see below) was the vehicle through which development would occur, based on the expertise of the project managers and the involvement of PGBI. Sugar Beet RSA and PGBI had the knowledge through which the Eastern Cape Provincial Government could begin achieving its own objectives. However, the question has to be asked, was any of this actually feasible?

Fuelling Discontent – Evolving Sugar Plans Shift to Ethanol

> A pre-feasibility study completed in September 2004 warned that given the high cost of building a processing plant, viability would depend on government allocation of financial support, land and water – and good and reliable producer prices. A full bankable study finalised a year later … gave the proposal the thumbs down. The plant needed would cost R1 billion but the strong rand, depressed world sugar prices, and having to compete against highly subsidised foreign beet producers would turn it into a white elephant. "They said to us: sorry, this is not going to fly," says Crew. On the plus side, PGBI pointed out that production costs per unit of sucrose were among the lowest in the world. "They told us to try and find an alternative use for this product". (Hendrickse, 2007).

The above quote sums the situation up nicely. The challenge for Sugar Beet RSA was that they were attempting to manoeuvre into an oversupplied domestic sugar market and highly competitive international one. When Sugar Beet RSA approached Tongaat Hullet, for example, they unsurprisingly met with opposition.[14] The sugar

[14] Prior to legislative changes in 2000, it was (and remains) the domestic market in which higher profits could be made as the price was determined by the South African Sugar Association and with inelasticity in the domestic market local prices could be forced higher than those of the international market. After the amendment of the Sugar Act (Sugar Act of 1978 (as amended) and the Sugar Industry Agreement of 2000 there are three main regulatory provisions within which the pricing of refined sugar in SA takes place, including: a tariff support relative to a US dollar-based reference price; a single channel export mechanism, and a local market proceeds-sharing agreement whereby proceeds earned by the SA sugar industry are divided amongst growers and millers according to a set formula (Department of Agriculture 2003, p.244).

industry would resist a major new sugar producer and, according to one former member of Sugar Beet RSA, they "*fought it tooth and nail*." However, according to a former member of Tongaat Hullet (2012), despite initial apprehension, the "*inevitability*" of the project shifted their view to one of "*being involved and controlling it*" rather than being in competition with it.[15] Indeed members of Tongaat Hullet doubted the seemingly outrageous claims that Cradock could produce sugar beet in the quantities Sugar Beet RSA was suggesting. Regardless of the production potential within Cradock, sugar is a vastly overproduced commodity and an interview with one of the Sugar Beet RSA managers suggested that it was the monopoly over sugar that lead to the downfall of the initial Sugar Beet RSA project (SBRSA Member B, 2011). Additionally, unlike Brazil or the EU, South Africa plays only a marginal role in the world sugar market. South Africa is essentially a price taker in a global market characterised by protectionism, skewed international markets and depressed world sugar prices. These two issues—the South African sugar market structure and prohibitive international markets—alone make the prospects for sugar production bleak.

Hendrickse (2007) continues:

> Late in 2004 national government launched its biofuels initiative, and Sugar Beet SA started negotiations with the Central Energy Fund and IDC. By the end of 2006 the co-op had sold Sugar Beet SA to Eastern Cape finance parastatal Uvimba, and the IDC had committed funds for a full feasibility study for building a sugar beet biofuels production facility. The study should be finalised in September, with construction starting in January 2008.

Clearly, the plans had begun to evolve in ways quite different to how the ECAC had imagined. The prior machinations around the original sugar mill had somewhat damaged the prospects of a feasible sugar project but biofuels had begun to provide new and lucrative opportunities. It is interesting to note the way in which respondents have described the process of requesting 'permission to seek an alternative' and the way in which 'the Sugar Beet RSA consortium agreed' (as is

---

The domestic market remains at close to import parity prices maintained through a local market proceeds-sharing agreement (that is, millers that sell more than their allotted local market share compensate millers that sell less than their allotted share). As there is already a surplus, any new projects will decrease proceeds in the domestic market and force more sugar into the export market, which would be to the detriment to the rest of the producers.

[15] This statement should not be read out of context. "Controlling it," means being a part and potentially reaping benefits rather than all out control.

noted above). One respondent continued along similar lines suggesting that the ECAC had spent a few million Rand and when George Ward died the other directors of the coop said "*well that's very well guys but we are actually a coop, we are not in the business of making biofuels*" (Consultant F, 2012). The ECAC then floated off all the intellectual property to Sugar Beet RSA, which then sold it to the ECDALA as noted by Hendrickse (2007) above.[16] The ECDALA then hired (retained) Roak Crew CEO of Sugar Beet RSA. On the other hand, a former director of Sugar Beet RSA (2010) was far more critical of the transfer of ownership, suggesting a more contentious situation. In this alternative version, Hilton Collett and Roak Crew had begun making decisions without the involvement of the other Sugar Beet RSA directors or the ECAC, manoeuvring towards and working with (securing financial support from) the Eastern Cape Department of Agriculture. For this reason, the ECAC "wanted out" of the project and asked to be paid the money they had invested in it already (Former SBRSA member, 2010). Yet another official from the ECDALA suggested that

> *sugar from sugar beet fizzled out, and then these guys [Sugar Beet RSA] were in trouble because they had spent their R5million, so then they knocked on the doors of government, which found the project to be potentially in line with objectives of land reform … That is how it was perceived, resulting in the department buying all the shares from Sugar Beet South Africa [RSA]; that R5million. The government, in the truest sense of the word, is not allowed to buy private company shares; they have got to use entities, which resulted in the ECRFC, being funded with the R5million to buy the shares. So now … AsgiSA belonged to the ECRFC, Sugar Beet [RSA] belonged to the ECRFC. So it's a vehicle for the department to do what it wants to do* (ECDALA official A, 2011).

It is in these early processes that the vision for the ethanol plant is inscribed. Bringing on government support was a necessary and insightful decision by members within Sugar Beet RSA. Although the Bankable Feasibility Study showed sugar not to be viable, bioethanol was an emerging topic in government (see Chapter 5) and in the popular media. Conferences on biofuels were also taking place at the time and,

[16] The link here is not obvious. Hendrickse suggests that Sugar Beet RSA was sold to Uvimba. Uvimba in turn is a financial arm of the Eastern Cape Rural Finance Corporation (ECRFC), which is an organ of the Eastern Cape Department of Agriculture. So essentially, Sugar Beet RSA was sold to the Department of Agriculture.

having seen the potential for sugar production, clearly biofuels would be a suitable market as well (ECDALA official B, 2010). A suggestion was made to rather focus on producing ethanol as a feasible alternative. The suggestion for ethanol clearly resonated with key interests in Sugar Beet RSA and yet another Joint Venture, would pursue a biofuel project using sugar beet from the Great Fish River Valley.

In the words of yet another respondent from ARDA (Sugar Beet RSA),[17] when the sugar project was finally "*scrapped … a couple of the guys hung in there and sold the concept to government*" (SBRSA Member B, 2011). The importance of the latter is the idea that projects need to be sold. Another member of ARDA suggested that "*we sold this project to [Min. Nkwinti] when he was MEC of Agriculture, and we, it's a liars contest, whoever pulls the right heartstrings on the right day gets allocated the money* (SBRSA Member A, 2011)." After 'selling' the project, Sugar Beet RSA—now wholly owned by the ECDALA—established a joint venture with the IDC (as the main but not major shareholder), the Central Energy Fund (CEF), with additional financiers planned to take on remaining equities. At this point, PGBI, who had been involved in earlier bankability studies and research phases of the alternative sugar mill, were appointed as project managers for the ethanol plant. It is here where the story of Cradock in Chapter 4 begins. Far more could (and should be said) about its turbulent trajectory and the trials and tribulations of establishing the 'core estate' and unfathomable shifts from sugar beet to sorghum but these are beyond the realms of this thesis. They are, nonetheless, critical to the emerging biofuels assemblage in South Africa and, in all likelihood, will continue to modify the very foundations of the biofuels strategy in the country, as the project has done so in the past.

[17] ARDA is the same 'company' as Sugar Beet SA. In a presentation by an ARDA representative at a workshop in Rhodes, it was suggested that the name was changed because Sugar Beet RSA suggests that they only deal with sugar beet, whereas they are also working with sorghum and thus required a more appropriate and comprehensive name (Somlotha 2011). They are not able to source enough sugar beet to run the factory and thus will rely on rotation with sorghum in the Great Fish River Valley and from imports from emerging black farmers in the former homelands of the Eastern Cape.

APPENDIX E: ENERGY IN SOUTH AFRICA, 'BIOFUELING' COMPLEXITIES AND THE MINERALS-ENERGY COMPLEX

The energy sector, as a part of a wider macro-economic constellation is also bound by specific rationalities and technological lock in, which are important considerations when considering the biofuels *problematique*. As Carolan (2010) describes in his paper on the United States, ethanol (although biodiesel is much the same) has had a meteoric rise partly because of the socio-technical system in which they reside, that is, they are an effect of their broader infrastructural, organizational, regulatory, and symbolic environments as much as they affect them through their introduction. In this Appendix, I will describe some of the complexities of the energy sector in South Africa, broadly outlining the details of the socio-technical system surrounding energy production and use in the South African context.

ENERGY AND DEVELOPMENT: GLOBAL AND SOUTH AFRICAN PERSPECTIVES

> Money allows agreements on relative "value" (how much of one thing will be exchanged for another) but it has no intrinsic value itself. It is simply a mechanism that allows the distribution of real "stuff". So if the economy is crashing, what is this "stuff" that is disappearing? It can be summed up in one word - energy (Lardelli, 2009 (ASPO)).

Energy is an essential component of human activity, also not due to any inherent value, but for the services it provides in the form of heat, light and motive power (Spalding-Fecher *et al.* 2000). It is central to achieving the interrelated economic, social and environmental aims of sustainable development (Cassim & Jackson 2003, p.2). Whereas 'energy economists' (Georgescu-Roegen 1971) have long recognised the role (or rather basis) of energy in economic development,[1] it has only recently being taken more seriously politically. Increasing (global) concerns of peak oil (and increasingly peak coal), inefficient energy systems being in use, and the devastating knock-on social and environmental effects or externalities of transforming and

[1] Some insisting that the economy is essentially a pastiche for the more fundamental transfer of energy. By way of example, Fernandez Duran (2012) provides a somewhat 'dystopian' outline of this in his book the Breakdown of Global Capitalism, based on declining surplus energy/oil. See also the ensuing debate after Georgescu-Roegen's (1971) paper, between Khalil (1991; 1990) and Lozada (1991).

consuming energy (Davidson 2006a),[2] have presented humanity with new and complex challenges. The energy debacle, when combined with food and water crises, warns of an impending 'perfect storm' according to Jon Beddington (2009).[3] The Oil Crisis of the 1970s was particularly instrumental in bringing issues of efficiency and finite resources to the fore globally. New energy futures—the bio-economy for one—may well present new problems but reforming the system is necessary nevertheless. Whether we are headed toward a Rifkin's (2011) Third Industrial Revolution or a rapid deterioration of geopolitical relationships and resource conflicts suggested by Beddington remains to be seen (see Sample 2009); inevitably the situation requires a political solution to what is an anthropomorphic problem.

There is, in this wider discussion of energy for development, an increasing reflection also on the political economy of the energy-economic system, viewed through the increasing recognition of energy services as a basic human need (O'Brien *et al.* 2007; Sanchez & Scott 2009; Wilson *et al*. 2012; Practical Action 2013). There are, for example, massive disparities between and within nations, as to who has access to energy and what is done with it. Increasingly it appears too that there are many lessons to be learned by the developed countries, from energy solutions developed for (and by) the poor, especially off-grid and integrated technologies. There is, of course, also the potential for further marginalisation not only through continuing depletion of energy sources but increasingly oppressive ownership of what remains. This latter point is especially relevant to the South African situation, which, despite being technologically advanced, has an exclusionary economy, based largely on energy-intensive industry, and that has struggled to translate cheap energy into widespread prosperity.

[2] Environmental impacts may be local, such nitrous oxide and sulphur dioxide from coal combustion, or widespread, such as from carbon dioxide, also emitted during combustion (Davidson 2006b).

[3] Beddington's (2009) perfect storm combines water, food and energy crises; at the very least, the combination of rising energy prices, a desire for energy security and the threat of climate change will continue to drive changes in the way societies work.

South Africa's Macro-economy and the Minerals-Energy Complex

The South African economy experienced high growth rates in the 1960s, because of mining and exporting raw materials within a regulated economy. Factors such as the world oil crisis and the changing gold prices added to the economic slowdown of the 1970s. From then on until 1993, increased public spending, economic sanctions and the effects of political instability stifled the economy. The period was characterised by poor growth performance, low levels of investments, rising unemployment, political instability, currency instability, widening deficits, falling living standards and growing inequalities. Growth rates have been relatively low since 1994 (Nkomo 2005) peaking in 2007 and declining with the Global financial crisis in 2008, though showing itself to be resilient since the global downturn.

As Philip (2010, p.7) describes the South African economy: the "commanding heights" are highly centralised, there are "high levels of concentration of capital and limited levels of competition in key sectors". This includes the energy sector described below. Small enterprises tend to be excluded from participation, while capital-intensive industries dominate, making employment creation expensive. Red tape makes establishing small-scale enterprises especially difficult (e.g. Mungadze 2013). Philip (2010, p. 7) further suggests that:

> the negative impacts of this economic structure on job creation and also on small enterprise development in the core economy are relatively well understood. However, the extent to which this economic structure constrains options and opportunities on the margins—including for subsistence and livelihood activities—is often overlooked.

Other descriptions concur and give an insight into the structure and output of the economy. For Bond (2005), the economy operates broadly with the MEC at its core or as its foundation (see Fine & Rustomjee 1996). Intermediate capital goods remain underdeveloped while luxury goods are produced locally at close to world standard (because of White demand and huge income disparity), whereas basic needs industries are extremely sparse. With increasingly deregulation these industries have also suffered, the textile industry being a case in point. Other challenges confronting the economy are stagnant levels of private investment, falling growth rates, limited employment creation and improving state capacity to increase the rate and quality of delivery of services for the poor (Eberhard, 2004). Although much focus has been

put on black economic empowerment, this empowerment has neither percolated to the majority, nor allowed for widespread inclusion of the black majority in the economy. Aubrey Matshiqi (2013), a political analyst in South Africa suggests:

> 2013 must also be the year in which business and government start tackling the deficit of trust and confidence in the interests of inclusive economic growth. If the ANC government and business fail to unite behind a common vision for the future of our economy, other economies on the continent will leave us behind and the highest price will be paid by those who remain economically marginalised.

The global convention of following an energy-intensive development trajectory is manifest in South Africa in the form of the Minerals-Energy Complex (MEC). The MEC is a form of capital accumulation in South Africa that incorporates a core set of industries associated with large-scale mineral extraction and energy provision (from cheap coal), while reaching beyond them in terms of corporate control and influence (Fine and Rustomjee, 1996; Fine 2008). The central tenet was that "the MEC lies at the core of the South African economy, not only by virtue of its weight in economic activity but also through its determining role throughout the rest of the economy" (Fine & Rustomjee 1996, p.5).

Eberhard and Marquard (2000) provide a useful reflection of the MEC—although do not name it as such—in their examination of apartheid energy policy. In this case, energy policy in South Africa closely reflects by (if not articulated) the "modernisation ideology" mentioned above. They highlight two recurring themes of this paradigm, which advocated state-led heavy industrialisation, based on South Africa's extraordinary mineral wealth with low cost energy as an input on the one hand, and increasing attention to energy security on the other. The approach was techno-centric and focussed on supply-side issues, given that during this time the demand side (other than industry) only consisted of a small, predominantly White domestic and business consumer base (*ibid*).

Even the most recent overriding government provisions of the National Development Plan (NDP) describes the situation in which "the size of the energy intensive mining industry and the fact that domestic energy prices have been underpriced, has resulted in energy-intensive beneficiation investments." There is then an important

development challenge linked with the Minerals-Energy Complex. Edigheji (2010a), for example, argues that restructuring the economy through a reduction in the reliance on the MEC and reversing deindustrialisation will be critical to South Africa becoming a development state (see also Fine 2010). However, as is the case with many of the proposals in Edigegheji's (2010) collective volume, this needs to be complemented by a competent bureaucracy, political support and adequate institutions and policies. It ignores that significant political and economic obstructions also militate against such a feat.

The sustainability and some immediate consequences of the economy's rapacious energy intensity are easily found. Rolling black-outs in 2008 and fuel shortages[4] prior to this were a vivid testament of burgeoning demand beginning to outstrip available supplies. More so, dramatic losses to the economy estimated at R50 billion (NERSA 2008, p.12) highlighted the central role of the energy sector in fuelling economic growth, whilst also encountering a similar range of challenges as those globally. The energy sector as a whole suffers some imposing challenges, which include (Cassim & Jackson 2003; Davidson 2006a; Nkomo 2005; Winkler 2006):

- the limited understanding of how the current structure of energy production acts as a disincentive to other energy forms;
- electricity pricing needs greater attention (low prices have also squeezed out energy efficiency and renewable energy focus);
- subsidization of the major energy industries has negatively affected more efficient sectors by diverting resources away from them;
- there is an urgent need to deal with the problem of carbon-intensive coal-based energy in light of various developments, such as growing domestic awareness of the damaging health and environmental effects of coal-based energy—pollution, especially from the four major refineries is a problem—and a heightened awareness by SA exporters of energy-intensive products such as steel and aluminium of increasingly stringent regulations in international markets;

[4] It should be noted that these shortages were not an absolute shortage but rather a temporary supply shock when the government imposed new clean fuel specifications. If anything, these shortages (re)established SAPIA and the petrol industry as a power-party within the country's economic and political well-being

- the meeting of social goals and public benefits has been independent of industry structure, which means electrification has been carried out by the old, vertically-integrated, publicly-owned utility Eskom and by local government distributors;
- identifying possibilities to restructure the electricity supply industry (ESI) and to continue to improve social equity through providing benefits for the poor and increasing access to affordable energy services;
- electricity access will not necessarily result in development and needs to be one part of integrated development strategies;
- energy efficiency standards are generally lacking;
- governance needs to be improved, which entails designing and making policy changes to free both the internal and external markets for goods, services and capital;
- macroeconomic stability is a prerequisite.

Renewable Energy Dynamics in South Africa

Ensuring sustainable[5] alternatives to South Africa's fossil dependence and dismantling the constraints of the MEC depends, in part, on ensuring social equity and economic efficiency and thus choosing appropriate economic models and policy instruments to minimise negative impacts (Nkomo 2005). Scholars in South Africa (Bekker *et al.* 2008; Eberhard 2004; Nkomo 2005; Spalding-Fecher & Matibe 2003; Winkler 2006; Cassim & Jackson 2003) have also begun engaging with the importance of energy for development, especially post-1994 when massive rollouts

[5] There has been an increasing usage of the term 'sustainable', as in sustainable development, and now 'sustainable energy', despite being a physical misnomer (energy cannot be created or destroyed), is associated with increasing awareness (and anticipated reduction) of the damaging or 'unsustainable' externalities associated with energy use. Whilst on the matter of definitions, it is also useful to suggest that the term 'energy' may be conceptually useful but is also imprecise in the way in which it is used in popular and political discourses. 'Energy' is transformed and theoretically constant so what is important is entropy, a thermodynamic property analogous to order and disorder in which a unit of energy of low entropy (order) is converted into the same amount of energy but with higher entropy (disorder) (see MacKay 2009). It is also better to differentiate between 'energy' and 'energy services' such as cooking or lighting, which consumers actually require.

of energy access[6] became important to undoing the injustices and neglect suffered during apartheid (see above).

From an energy poverty perspective, the goals of universal access to electricity has become a dominant feature of energy policy but 'free electricity for all' has not been delivered and is inoperable in South Africa; alternatives will be needed where the grid cannot be established (National Planning Commission 2011c). Recent research also highlights that the linkages between energy and development outcomes in the South African case are complex and not deterministic (Matinga & Annegarn 2013), reflecting a general critique of the 'energy ladder' and the expected processes and outcomes of transitioning from one energy type to another (Hiemstra-van der Horst & Hovorka 2008; Masera *et al*. 2000).[7] Furthermore, "useful research into household energy in the 1990s has had little follow through but could be used to develop integrated programmes to tackle poverty" (National Planning Commission 2011c, p.147).[8] Alternative renewable sources of energy are also only in their infancy in South Africa and only since COP17 has there been increased engagement and decisions being made.[9] Although various technologies have been available for decades,[10] their use has not had significant political support and has thus lagged compared to leading industrialised countries, such as Germany and even fellow

[6] Access to energy took a predominantly 'on-grid' direction. Proposals prior to 1994 of accelerated electrification lead to a national electrification programme implemented by the Government of national Unity. Eskom had also undertaken electrification programme under the banner of 'Electricity for All' with significant progress made—3million houses connected— before phase 1 of the National Electrification Programme in 1994 (Davidson 2006b, p.7).

[7] There is an associated debate here, in which there is some criticism of the actual transitions that occur that do not necessarily or automatically reflect the neat prescriptions of the 'energy ladder' (Hiemstra-van der Horst & Hovorka 2008; Howells *et al.* 2010) in addition to that of the impacts of making such a transition as described in the text. Additionally, one has to concede that providing electricity means very little unless it is part of a wider development programme. Electricity provision relies on extant income generation possibilities and the ability to accumulate 'white goods' and associated technologies, which allow the benefits of electricity to be realized.

[8] This would most likely be referring to the work of Prof. Anton Eberhard, who is now a national commissioner and an expert in diverse features of South Africa's energy sector.

[9] Strategically, it was at the COP17 negotiation that the Department of Energy finally announced its preferred renewable energy bidders as part of an on-going independent power producers bidding process (South African Government News Agency 2011) .

[10] Although efficiencies are continually improving, most renewable energy technologies could be considered as relatively mature. To confuse matters the International Energy Agency has separated renewable energy technologies into three generations (not to be confused with the 'generations' of biofuels described above) in which, apart from third generation technologies— still under development and include concentrating solar power, ocean energy, enhanced geothermal systems, and integrated bioenergy systems— renewable energy technologies are commercially available but may require subsidies.

BRICS states such as Brazil. According to some officials from the former DME, renewable energy and rural energy were considered one and the same and electrification was the only priority. As a former secondment to the DME suggested:

> *I came to the department and my task was support the government to formulate a renewable energy strategy and energy efficiency strategy, and from there prepare implementation plans...And I mean they were laughing at me … Basically there wasn't any need for what I was talking about… a few years ago in the Department, the people, they couldn't even pronounce the word renewable energy, they used to call it rural energy… They couldn't get it round their head that there was a difference between rural and renewable energy.*

This essentially relegated renewable technologies to rural areas rather than being considered potentially useful in all areas.[11] Davidson and Winkler (2006b, p.12) corroborate this to a degree by suggesting that:

> [T]he expansion of renewable energy in South Africa is mostly in the rural areas, where poor households are electrified with solar home systems (SHSs) where the national grid cannot economically penetrate.

They also go on to suggest that:

> a broader approach of 'energisation', combining renewable energy technologies with other sources, for example [liquid petroleum gas] LPG or wind, has been also been contemplated.

A White Paper on Renewable Energy was developed in 2002 setting out government's strategy. Some effort has, however, gone into individual projects, especially given power shortages since 2007; though most of these fall within demand side management rather than transforming the supply side. Certainly, while the biofuels strategy was being developed and there was calls for 10000MW of renewable energy, very little else was considered by the DME. Having very few staff dealing with renewable energy (at one point only two officials) and considering other projects as "chicken shit"[12] compared to biofuels, one can begin to see why (see Chapter 5).

---

[11] There has been a perception that 'electricity for all' means grid electricity for all. The situation is one where there are also off-grid systems being pursued, largely through support from Eskom, such as the solar home systems (solar water heaters especially) that the government is presently supporting (Davidson 2006b), with mixed results and much expense (Afrane-Okese and Muller, 2003).

[12] In a discussion of government's programmes, there were a few projects including a clean-burning programme (Basa Njengo Magogo) and projects using biogas from chickens and cattle, but these

In 2004, the International energy agency (IEA 2007, p.3) described renewable energies as being "essential contributors to the energy supply portfolio as they contribute to world energy supply security, reducing dependency on fossil fuel resources, and provide opportunities for mitigating greenhouse gasses. At this time, they suggested renewable sources comprised 13.1% of the total fuel share globally, with a growth rate of 2.3% over the last 33 years (*ibid*., p.3-4). However, when looking into specific sectors, such as energy supply, figures differ and, for example, 17.9% of electricity was produced from renewable sources.

While there is some indication renewable energies are finding some niche within the global energy mix, the IEA fact sheet points towards an interesting contrast in South Africa. Whereas the overall contribution of renewable energies in total account for 10% of the total energy mix, when one excludes traditional biomass combustion, this figure drops to as little as 0.2% (IEA 2007, p.6; Winkler 2005). Further to this, renewable energies in South Africa have generally been focussed within niche markets13, for example around non-grid electrification, given the lack of incentive and an encompassing renewable energy policy (Holm & Agert 2002; Winkler 2005). Initially policy proposals to support and expand the fledgling renewable energy industry was one of Renewable Energy Feed in Tariffs (REFIT), though this was subsequently changed to a 'preferred bidder' programme in the form of a renewable energy independent power producer procurement (REIPPP) process. This latter process has become part of the South African Renewables Initiative, signed at the COP17 in Durban. Additionally, the Integrated Resource Programme 2010 proposed adding approximately 42% renewable capacity by 2030.

There are a few major types of constraint or barriers to renewable energy uptake. Physical constraints suggest that countries with a rich resource endowment (wind, water, sunlight *et cetera*) that can be converted into renewable energy will enjoy a

---

were failing due to local preferences for the grid. It is thus that the comparison of chicken shit comes about.

[13] Some for-grid renewable energy does exist, for example, co-generation using bagasse and small hydro facilities (Winkler 2005) with more expected as the IPP power-purchase agreements are finalised in July 2014 (Department of Energy 2012).

competitive advantage above others. As an example, South Africa has one of the best solar resources in the world (Fluri 2009), whilst hydro and wind resources are more limited ((Banks & Schäffler 2006). Other constraints to the uptake of renewable energy sources include cost effectiveness and financial risk and lacking policies or political will, whilst in South Africa limited innovation and path dependency are also problematic (e.g. Pegels 2010). Increasingly, international political pressures and growing environmental concerns have raised expectations around renewable energy and have meant policies are being devised to incentivise their use (thus overcoming the cost-constraints) and bolstering research and development of technologies. Here, it is imperative that cost-related and R&D policies complement one another though in South Africa, the domination of fossil fuels industries have curtailed such innovation (*ibid.*). In the next sections, these fossils-based energy sectors are described in greater detail.

The Electricity Supply Industry in South Africa and Some Policy Perspectives

In general, South Africa's energy consumption per capita is high compared with the world average: 2.7toe[14] versus 1.8toe with demand increasing at approximately 4% (ABB 2011). South Africa's energy sector is characterised by a wealth of natural resources including both fossil fuels (cheap coal being the most widely exploited) and renewable sources—solar especially (Kenny 2006). Here it is important to distinguish between energy resources and energy supply services. Despite multiple energy resources, coal dominates the energy mix in South Africa, accounting for seventy per cent of energy consumption followed by oil (13%), biomass (10%) gas (3%) and nuclear (3%) (*ibid.*). A well-developed infrastructure for both transport fuels and grid electricity is continually being expanded; the energy supply sector is also undergoing significant reforms, albeit slowly in some cases (e.g. Eberhard 2004).

Eberhard (2004, p.37) outlines the most prominent changes, in which post apartheid "it was inevitable that energy policy would be transformed from a defensive

[14] Tonne of oil equivalent (toe) is a unit of energy equal to burning one tonne of oil. In South Africa, this follows the European standard of an assigned calorific value of 41 868 kilojoules/kg or net energy equivalent of $42x10^9$Joules.

obsession with security to a new focus on promoting social equity and improving economic competitiveness as South Africa re-integrated with the global economy". I will look into these main reforms when discussing the two major energy infrastructures in South Africa, transport fuels and the electricity supply industry (ISI).

Eskom's Powerful Grip on Power and Policy

Although the focus of this thesis is focussed on biofuels and therefore discussion of the fuel infrastructure is necessary, first, the importance of coal as the dominant energy source deserves some attention too. In 2006, when the DME presented the *draft* Industrial Biofuels Strategy, coal was the major primary energy supplier with a contribution of 65.9% to the total primary energy supply (DoE 2009, p.3). (Crude oil, the second largest supply, accounted for 21.5% during the same period.) Not only is coal actually a critical feedstock for manufacturing fuel in South Africa, a discussion on reforms in the energy sector by Anton Eberhard—a leading academic in the sector[15]—is informative for what he suggests of policymaking (in much the same way Patrick Bond is important for his critique of development policy). Though not explicitly focussed on the process of policymaking, his discussion is revealing.

In South Africa, one major, vertically and horizontally integrated operator, Eskom, dominates the generation and transmission of electricity. They are also largely in control of distribution and retail too, although most consumers buy electricity from municipal distributers, who buy their electricity from Eskom. Following international practices but more so a result of internal political and economic drivers,[16] over the last fifteen years there has been increasing interest from the State to reform the electricity sector and restructure the monopoly of Eskom. Eskom has already been corporatised as part of wider structural adjustment plans in the economy (along neoliberal lines), while massive improvements in access to electricity has

[15] No doubt, being a member of the University of Cape Town's Energy and Development Research Centre, who were closely involved with the ANC and a variety of energy forums has informed his perspective. These forums involved significant policy debates leading to, for example, the accelerated electrification programme as well as the energy section of the RDP (Marquard 1999).

[16] The most important of these is the desire to restructure four major State Owned Entities—Eskom being one of them.

accentuated the commitment to social development goals and, symbolically, creating a modern state (Matinga *et al*. 2014). Professor Eberhard (2004) considers this (especially the macroeconomic focus) indicative of a paradigm shift, emanating from the Energy White Paper (DME 1998). The paradigm shift here referring to a move from apartheid-style (secret and un-debated) planning focused on providing low-cost energy supplies to power mining and primary industry and energy security for the apartheid state (see discussion on the minerals energy complex above) while neglecting the poor majority. The new paradigm:

> was supported by three developments: first, the intellectual development (mainly through an ANC sympathetic research group) of a new paradigm with emphasis on the "three E's" (economic efficiency, social equity and environmental sustainability); second, the political process of legitimizing the new paradigm (though public consultation and publication of a White Paper); and, third, its structural realization in the economy and society – such as the shift in funding to the national electrification programme (Eberhard 2004, p.31).

In the development of the White Paper, there are again commonalities with some of the key themes this thesis interrogates for biofuels. The importance of technocracy or expert opinion is tantamount, as are mobilising metaphors or the narrative of the 'Three E's' but more so it is the networks surrounding such expertise and storylines that are crucial. Experts' access to the policymakers grants them special privileges in policymaking processes (they are the policymakers!), with important implications for the direction and feasibility of policy implementation. Importantly, Eberhard was part of an intellectual pool that had begun doing research on energy challenges of low-income households during the 1980s. Despite or perhaps ironically, being funded by the apartheid DME lead to some tensions, especially given the closeness between these scholars and the ANC at the time. The influence of this pool of researches is clear from the above discussion and the structure of the resultant White Paper (see Box 2). As Marquard and Eberhard (2000, p.5) further describe:

> A pool of expertise in this (for South Africa) new area of energy policy was built up at the Energy and Development Research Centre at the University of Cape Town, which launched a massive policy research project in the early 90s in anticipation of a new government. This project defined the principles of the new paradigm, and expanded the original emphasis on energy provision for the poor to a central principle of ANC energy policy.

Box 3: The White Paper on Energy (1998)

EDRC were contracted to develop the White Paper first involving public consultation (including a National Energy Summit), writing and then production and approval. The production and approval component of the process involved several consultation meetings that led to a draft paper in June 1996; this became public only in July 1998 due to several political and administrative problems. Under the auspices of the Parliamentary Portfolio Committee, public hearings were held and the final paper was published at the end of 1998.

The White Paper has four parts: context and objectives for energy policy, demand sectors, supply sectors, and crosscutting issues.

In the context and objectives, five policy objectives were agreed on:

i. Increasing access to affordable energy services;
ii. Improving energy governance;
iii. Stimulating economic development;
iv. Managing energy-related environmental and health effects (including access to basic energy services for poor households while reducing negative health impacts arising from energy activities);
v. Securing supply through diversity.

Energy efficiency and free-basic energy were important issues. The need to provide of equitable access to affordable public transport was noted, as were the challenges in doing so. The provision of energy for smallholder agriculture, rural schools, clinics, roads, and communication infrastructure were also addressed.

Supply sectors provided an outline of issues pertaining to electricity, coal, liquid fuels, gas and other energy suppliers in the country.

Cross-cutting issues include:

• integrated energy planning;
• good statistics and information;
• the promotion of energy efficiency;
• a balance between environmental, health and safety and development goals;
• energy supplies and the private sector to carry out appropriate research and development;
• development of human resources;
• capacity building, education and information dissemination;
• the facilitation of international energy trade and co-operation;
• the alignment of fiscal and pricing issues by the use of levies, tax differentials and support for more environmentally benign and sustainable energy options including energy efficiency.

The White Paper became a reference point for further reforms that, although not all were implemented, were broadly consistent with the government's macroeconomic focus on liberalisation, improving social equity, environmental sustainability, energy sector governance and energy security. Whilst providing some remarkable objectives[17], Eberhard notes that:

> These bold statements originated not from any commissioned studies, neither did they emerge from a formal consultative process with industry members. They were the result of the convictions of a small group of

[17] Including, for example, "giving customers the right to choose their electricity supplier; [i]ntroducing competition into the industry especially the generation sector; [p]ermitting open non-discriminatory access to the transmission system, and encouraging private sector participation in the industry".

> analysts and government officials[18] that were observing international trends in power sector reform, and were beginning to be concerned with the potential problems of monopoly power (2004, p.31).

It is thus not only a network in place but also the political legitimisation of the network and its proximity to the bureaucracy that provided the platform from which policies would be development. Marquard and Eberhard (2000, p.5) add that:

> the political aspect, crucial to the adoption of the new intellectual orientation, began with the unbanning of the ANC in 1990. A productive relationship between researchers and ANC activists led to collaboration in the policy processes that surrounded the negotiations preceding the 1994 elections. Crises in a number of areas of energy policy, notably the petrol price and the issue of electrification, led to the formation of multi-party task teams to negotiate stop-gap energy policies in the run-up to the elections.

When the White Paper was finally released it was "big on principle but not on specifics, and implementation, especially in the area of restructuring, is proving complex (Marquard & Eberhard 2000, p.5). Professor Anton Eberhard also provides an important insight into how such policy has been operationalised. He suggests that, despite some impressive reforms, these are somewhat 'token', or only the start of what remains an enormous project. So, while:

> the urgency of promoting social equity and extending improved infrastructural services to the majority forced Eskom and the large municipalities to respond to the challenge of electrification … the reform of the overall [electricity supply industry] lagged behind … the process of reform of the distribution sector [for example] has been slow and has been frustrated by the complex web of political interests at local government level and the fear of loss of control of an important infrastructure service and large income streams" (Eberhard 2004, p.37).

The success of this paradigm shift must, to a large degree, be measured by structural realisations within the economy. One of the most impressive impacts, although

[18] In one respect, these analysts were later vindicated. According to Eberhard (2004), they argued that "South Africa is living on borrowed time in terms of low electricity prices" and that "a vertically integrated, state-owned, monopoly industry, even if it is corporatized, is unlikely to make efficient investment decisions". Such sentiments resonate predictions made in the White Paper (in which Eberhard and other experts were involved) that South Africa would run out of power by 2007. Dramatic blackouts in late 2007and concomitant load shedding in early 2008 (e.g. Hlongwane 2013), as well Eskom's recent application for tariff increases (Njobeni 2012) seem to reflect their warnings ominously. It would seem no one ever acted on the policy.

arguably this was characteristic of the emerging paradigm shift than as a result of the White Paper, was the massive role out of electrification in the country. Whereas there has been considerable reform in the electricity supply industry, the same is not as true for the liquid fuels sector.

South Africa's Transport Fuel Sector

In contrast to the monolith of Eskom, the fuel sector in South Africa comprises a number of multi-nationals, including the former parastatal Sasol; a chemical company now with international reach (see below). There are also remaining state-owned operations involved in the supply side. Mossgas was established by the government in 1992, which converts natural gas sourced in Mossel Bay into liquid synthetic fuels. Its production capacity is 45,000 barrels per day of crude oil equivalent; the product is refined to produce petrol, diesel, kerosene and LPG from a feedstock comprising 4.9million m^3/day of natural gas (IEA 1996: 180). The Petroleum Oil and Gas Corporation of South Africa (PetroSA), was established in July 2000, merging Mossgas and Soekor.[19] The goal of the PetroSA is to be a leading integrated provider of oil, gas and petrochemicals competitively in African markets and beyond. The overall production of PetroSA is eight per cent of the liquid fuel requirement of South Africa. Alcohols and small quantities of transportation fuels are exported worldwide. Nevertheless, South Africa still imports most of its fuel requirements. Local reserves are limited to small fields in the Bredasdorp Basin off the south coast: the Oribi/Oryx Fields and the Sable Field, with proven reserves of 49million barrels in 2002(Kenny 2006).

Another important state institution is the Strategic Fuel Fund, a subsidiary of the Central Energy Fund, which stockpiles strategic reserves of crude oil. In 1988, it stocked up to one-and-a-half-years' supply, which was reduced to about a third by 1995 when government approved a stock equivalent to four months supply, about 35million barrels (Trollip 1996). There is currently draft legislation revising this

[19] Soekor (Pty) Ltd was formed by the government in 1965. It is responsible for the control and coordination of petroleum exploration and offshore activities in the country, including policy and regulatory functions in this area.

downwards and holding a strategic stock equivalent of sixty days of net imports (DoE 2013).

There are currently seven major oil companies operating in South Africa: British Petroleum (BP), Caltex, Engen, PetroSA, Sasol, Shell, and Total. All of these companies, except PetroSA (see below), are vertically integrated in South Africa, that is, they operate at each stage of the supply chain—refining and production, storage, wholesale marketing and retail. There are four crude oil refineries (Natref, Calref, Sapref and Enref), one synthetic refinery utilising natural gas (Mossref) and one synthetic refinery currently utilising coal (Secunda).[20] Although synthetic fuel and crude oil refineries use different inputs and technologies in their production processes, they nevertheless produce similar products. The composition of the output of a refinery is, within narrow limits, fixed by the technology used at the refinery and the composition of its raw materials. Coastal refineries typically produce a balance of high-value and low-value products, based on the need for bunker oil (a lower-value product). The inland refineries typically produce more high-value products than the coastal refineries. Our interest here resides in the so-called high-value or 'white fuels', which are described next.

The Changes and (Peculiar) Structure of South Africa's Fuel Terrain

One could delineate, broadly, three main shifts in the development of the South African liquid fuels market (Swart 2010). The first was a situation of complete international reliance. Prior to 1954, South Africa had no refining capacity and imported all its petroleum. In the second phase, domestic production of fuel was prioritised. An important government decision in the 1950s, made for political and economic reasons, was to embark on a programme of producing liquid fuel from coal (Davidson 2006b). The latter lead to the formation of the South African Coal, Oil and Gas Corporation Limited, later Sasol Limited, initially funded by the Industrial Development Corporation (the same corporation now investing in Biofuels).

[20] It should be recognized that, because these fuels are produced from existing fossil fuels, and are then burned as fossil fuels, their associated carbon dioxide emissions are higher; roughly double (Wilson *et al.* 2005, p.13).

Production of liquid fuel started at Sasol One in 1954.[21] In this year the multinational fuel company Mobil commissioned the Genref refinery, later to be called Enref (when Mobil changed its name to Engen). At this stage, all refined products used were imported and distributed by BP, Caltex, Mobil, and Shell (Trollip 1996) but the growing demand for liquid fuels justified the development of local refineries as much as it did a synthetic fuels industry. One could then match this second phase with the general securitization philosophy of the apartheid government in which, like other energy policy, liquid fuels policy was structured towards achieving security of supply (Marquard & Eberhard 2000). The formation of the synthetic fuels industry encapsulates the apartheid state's affinity for technological solutions although deals struck (see below) between the state and 'big oil' ensuring profits and obliging the uptake of Sasol's production highlights the state-led approach to industrialisation.

The security of supply approach has important geographical implications, as Sasol's refineries were developed in the inland regions adjacent to coal mines. This led to complex 'locational' economics, concomitant regulatory systems and logistical infrastructures (Competition Commission 2006), all heavily subsidised by the apartheid government. Sasol One, the first synthetic fuel (or 'synfuel') refinery was built in Sasolburg, backed on the 1954 Main Supply Agreement (MSA). Also known as the Sasol Supply Agreements (SSA), the MSA split the country into two areas—an inland Sasol Supply Area and a coastal belt handled by multinational refineries[22]—and obliged the oil companies to service their marketing requirements in the inland or 'Sasol supply area' by purchasing all of Sasol One's production volumes, pro-rata to their market shares. After the global fuel crisis and a fuel embargo in the 1970s, Sasol Two and Sasol Three were commissioned in the early 1980s. These two refineries were built in Secunda, also within the Highveld region. As these new refineries came online, the MSA was extended, to include Sasol's increasing output.[23]

[21] The synfuels project was also extended to include gas-to-liquid technologies with Mossgas, also heavily subsidised by the government, developed in 1992 (Trollip 1996).

[22] The refineries of the coastal region some considerable distance from the country's inland industrial hub and the major market for fuel are a testament to South Africa's historic reliance on imported crude-oil products (Competition Commission 2006).

[23] The MSA was effectively a market share agreement that stipulated the following until it was terminated in 2003 (verbatim: Competition Commission 2006, p.22):

The third phase noted by Swart (2010) was the dismantling of the MSA in 2003. The petroleum sector is still, however, governed by a labyrinth of agreements[24] between government and the oil industries, which essentially regulate the price of petrol and diesel (Figure 9) and how it is distributed, produced, transported and sold. Within the gamut of regulations pertinent to the fuels sector—pricing; strategic stocks; specifications and standards; import and export; manufacturing; wholesale and retail—standards and specifications are becoming increasingly important and stringent within the fuel market and are especially important to the uptake of biofuels, as are taxes and incentives. South Africa, although nearly a decade behind in any fuel-grade improvements, is following European clean-fuel specifications in order to minimise environmental damage, as well as provide better performing fuels for vehicles.

The current clean-fuel specifications in South Africa (CF1) are of equal quality criteria to Euro 2, which was enacted by the European parliament in 1996 (Directive 96/69/EC of 1996). These were subsequently upgraded to Euro 3 in 2000 whilst South Africa's specifications remained fixed.[25] Draft documents, released by the Department of Energy in 2011, have confirmed a commitment to cleaner fuels in which the CF2 specifications (as adopted) will match those of Euro 5. The reason, however, may be as much (if not more) about economics than minimising pollution.

- oil companies were obliged to purchase Sasol product up to a maximum of 7 740 million litres per year;
- each individual company would 'uplift' a volume of Sasol proportional to their respective market share;
- the price mechanism was remained based on the principle of import parity pricing through the 'in-bond landed cost' (a formula for calculating retail fuel prices in South Africa since the 1950s).
- a revision of the 'Blue pump agreement' in which Sasol's retail presence (at petrol stations) was limited 'blue pumps' at each station with the new agreement did afford Sasol certain marketing rights.

The effect of the MSA was that other oil companies purchased 90% of Sasol's white fuel output. Sasol's market share at the "blue pumps" at other oil companies' service stations was capped at 9.23%, while Sasol was also permitted to market 22.5million litres of diesel into the commercial market.

[24] For example, the 'upstream'—exploration and production rights, technical co-operation permits and reconnaissance permits—is controlled by the Minerals and Petroleum Resources Development Act of 2002. The 'downstream' industry and fuel prices are controlled by the Petroleum Products Act (Act no. 120 of 1977) and a number of industry agreements such as the former MSA (Cassim & Jackson 2003).

[25] In brief the evolution of the European Fuel Specifications are Euro 1 (1993), Euro 2 (1996), Euro 3 (2000) Euro 4 (2005), Euro 5 (2008/9) and Euro 6 (2014) with individual regulations also provided for specific types of vehicle.

South Africa car manufacturers are producing two types of vehicle for the domestic and export market, which is uneconomical.[26] These draft regulations have become a 'glimmer of hope' for the biofuels industry, as they suggest biofuels will play a role as a replacement to the existing aromatics, which will need to be removed. Their hopes are somewhat premature though. As an environmental consultant at SAPIA suggested, "there are many ways to skin a cat". I will return to the specifications later on, as it is an important yet neglected issue in the biofuels policy's development.

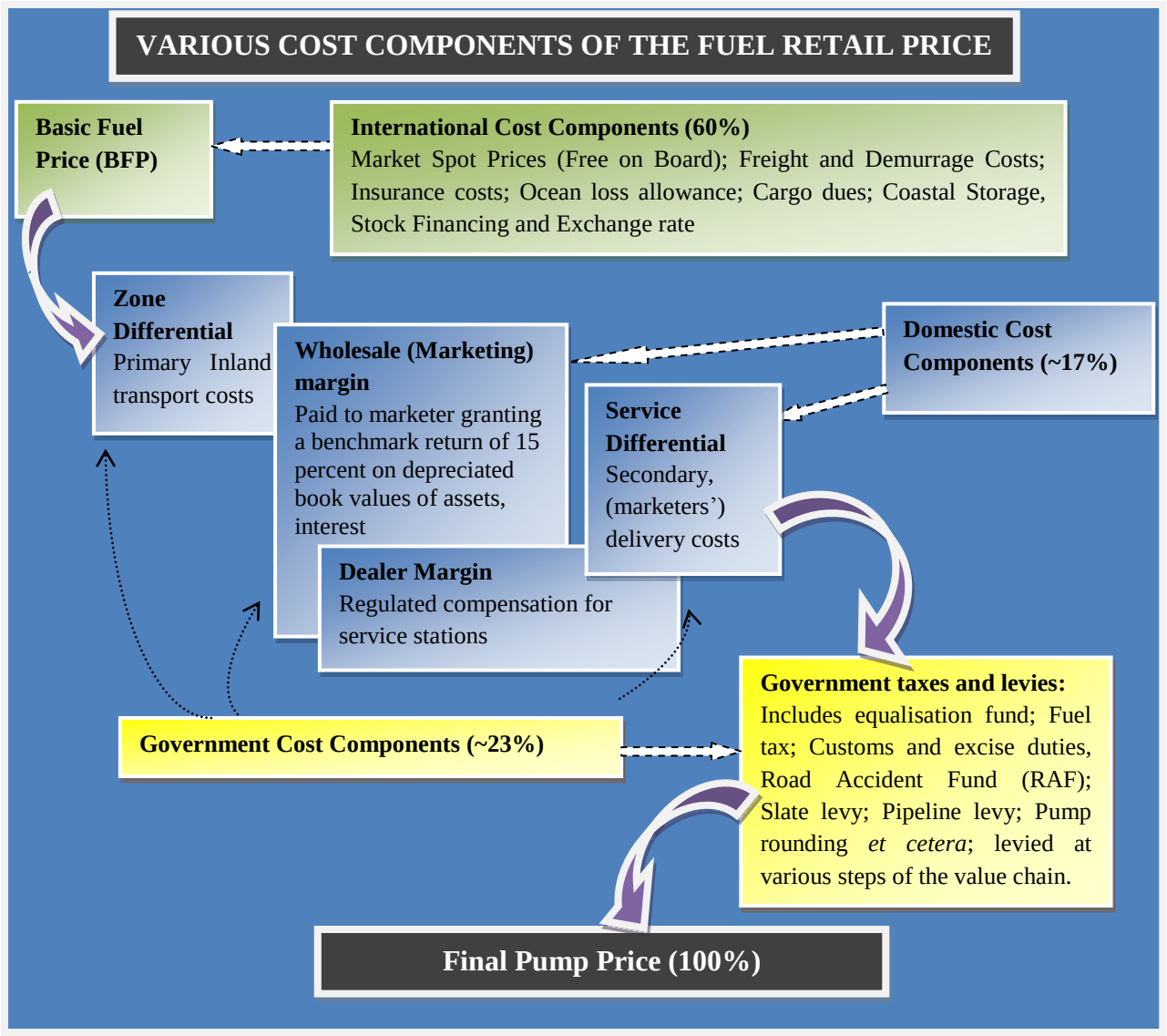


Figure 9: Schematic overview of the fuel price (author's own work)

[26] A similar thing can be seen by the introduction of 95 octane fuels and the removal of lead from fuel. While there are obvious environmental benefits, it also allows the expansion of Euro 5 rated vehicles in South Africa (e.g. NAAMSA 2005). The importance of these aspects is also acknowledged within the discussion document for fuel specifications released in 2011 (Department of Energy 2011a).

In 2006, the transport sector (26.8%) was second to industry (32.2%) in terms of energy consumption in the country (DoE 2009, p.7). Most of South Africa's liquid fuel requirements are imported in the form of crude oil. Approximately thirty per cent is sourced from coal through Sasol's coal-to-liquid refineries and all of the natural gas production from PetroSA is converted into liquid fuels, supplying about seven per cent of national liquid-fuel requirements (DoE 2009, p.2). Demand for liquid fuels is dominated by petrol and diesel.[27] The transport sector accounts for some 75-80% of the demand for these fuels, with most petroleum products being used in road transport (DME 2002a; DoE 2009). The situation is, however, in a constant state of flux.

An important trend is that the consumption of petrol has been declining in relation to diesel since 1995; this trend then reversed in 2010 (SAPIA 2011). In absolute values, however, petroleum refining capacity in 2006, (including gas- and coal-to-liquids) reached 10,954,815 kilolitres of petrol, compared to 7,457,922 kilolitres of diesel (DoE 2009, p.31). In their Mthombo Refinery proposal document, PetroSA forecasts that diesel consumption will grow at 4.5% per annum and petrol consumption at 1% per annum between 2012 and 2020. It should be recognised that these figures might be completely unrealistic as they take little recognition of potential price fluctuations in the international oil prices and their attenuating impact on demand. The depressed oil demand after the price shocks of 2008 provide ample evidence of this (Wakeford 2012).

Whereas price fluctuations are important in the short term, equally serious are general trends. Reflecting increases in crude oil prices. In 2005/6 petrol prices were rising dramatically. Petrol prices (coastal) increased from 429c/l in 2004 to 612c/l in 2005 whilst temporarily dropping to 585c/l in 2006 (DoE 2009). The South African Petroleum Industry Association reports different (cumulative) figures of 471c/l, 506c/l and 636c/l respectively (SAPIA 2011). Diesel, while cheaper, had similar

[27] Consumption of other liquid fuels is an order of magnitude smaller than those for petrol and diesel. Jet fuel is obviously consumed in aviation, while kerosene and LPG are important in the residential sector.

price changes. Internationally, oil was approaching $65 bbl, a price at which biofuels looked particularly lucrative. The rises seen in 2005/6 were nowhere near as severe as the near doubling of that price in 2008 (see SAPIA 2011). By this time, the biofuels strategy/industry was in disarray and more than anything the price shock of 2008 brought other priorities, namely food security, to the fore; so too did other intervening factors (see Chapter 7).

Also weighing on policymakers decisions in South Africa is that the country is close to outstripping its refining capacity.[28] It is here where Mthombo refinery, mentioned above, is important. This is PetroSA's proposed response to such incapacity. The proposal for Mthombo emerged out of the DoE's Energy Security Master Plan in 2007 but the issue of shortfalls in refining capacity was increasingly being recognised (e.g. Planting & Smith 2007) and remains important in news articles (Wakeford 2012; Creamer 2012) and the National Development Plan (National Planning Commission 2011c). The basic issue is that the proposal for Mthombo Refinery—increasing South Africa refining capacity—is only one solution rather than *the* solution. It is also only one means to increase refining capacity; individual refiners, for example, can also upgrade their existing capacities and in any event, it still leaves South Africa vulnerable to international oil markets. The economics of refining are complicated, especially given the very modest increase in demand from South Africa, highlighting the potential for alternative solutions, and the weakness of PetroSA's business case for Mthombo in the first place (Wakeford 2012). The challenge does, however, reinforce to some degree the importance of biofuels (or any alternatives for that matter) but at the same time 'Mthombo-thinking' might well have overshadowed biofuels both as a policy issue and as a viable competitor to refined products (e.g. de Bruyn 2009). Such standpoints remain speculative but highlight an increasingly tense situation that remains unresolved.[29]

[28] It should be noted here that with excess refining capacity the fuel market of South Africa also includes Botswana, Lesotho, Namibia and Swaziland exporting 1.3billion litres of fuel to these countries in 2009 (Department of Energy 2011a). Shortfalls in the domestic market is therefore equally serious for the region.

[29] It is also worth noting that the IDC has become involved in the continuing feasibility studies (Creamer 2013). Their involvement is interesting given the proximity of Coega, the proposed site for the new refinery, to the Cradock biofuels plant, which, as yet, has received insufficient off-take agreements with existing refineries. It is also interesting as one has to question the strategic

CONCLUDING DISCUSSION

While no country has made a successful industrial transition without investment into agriculture, humanity has only ever evolved to new systems of manufacture and development through changes in energy use. Currently, South Africa has a fossil-fuel intensive economic trajectory controlled by powerful interests, from 'Big Oil' and the monolith of Eskom. There has been some rhetorical shift in policy. The National Development Plan makes it clear – the green economy emerges from environmental necessity but also South Africa's increasing energy shortages. The NDP suggests that the state will be 'procuring about 20,000MW of renewable electricity by 2030, importing electricity from the region, decommissioning 11,000MW of aging coal-fired power stations and accelerated investments in demand-side savings, including technologies such as solar water heating. Such goals seem optimistic, given that the 10,000MW proposed for 2015 in the Renewable Energy White Paper seems unlikely to be reached. Overall, the NDP at least suggests new commitments towards renewable energy and a transition to low carbon economy, which may be a catalyst for wider support. There is even mention of biofuels in later sections of the Plan, through the contribution of agriculture to a 'green economy'; however, in a much later section focussing on liquid fuels, biofuels are not considered an option because of water issues. (That is, if biofuels are to be used, they will more likely be produced elsewhere; once again, lofty documents produced by a task team appear to contradictory in different sections.)

In a sense, the NDA expresses ambivalence to biofuels that the contents of this and prior appendices and chapters somewhat present as inevitable. There is potential for rural development but how this is to be understood and is understood by government is unclear and often oversimplified. Although there are clear expectations and pronouncements of what policies need to do (e.g. Freund 2010, p.23), there is far more that needs to be done to examine how these policies are made. This is not a new sentiment. Margquard and Eberhard (2000, p.7) conclude:

> The main challenges which lie ahead are all focused on the policy process: how to match policy with capacity, with resources, and with real structural

---

interests of the IDC, if, for example, the Mthombo refinery could ultimately squash the fledgling biofuels industry.

> transformation … Global challenges such as international competitiveness and climate change will require a degree of coordination within and without government unprecedented in the energy policy process.

Whilst energy security is a priority, for both rich and poor, it is unclear where biofuels (and renewable energy in general) actually fit in, given the continued emphasis on and control by powerful vested interests within the energy sector.[30] It is hoped that this thesis has added some further insight into the nature of the policy process, and suggest that while Margquard and Eberhard (2000) are indeed correct, perhaps policy *and* policymaking are the problem, and better processes are only part of the solution.

[30] The skewed nature of the industry is most evident when considering the government's R47-billion worth of investment in renewable energy, which appears to be substantial (SACPN 2012), compared to the under-estimates of R200-billion to be spent on Medupi and Kusile, the new coal-powered stations (Donnely 2012). However, of course, I do not wish to misrepresent the importance of a consistent and reliable electricity supply system.